THE MEDICAL JOURNAL OF AUSTRALIA

VOL. I.—33RD YEAR. SYDNEY, SATURDAY, APRIL 27, 1946. No. 17.

Table of Contents.

[The Whole of the Literary Matter in THE MEDICAL JOURNAL OF AUSTRALIA is Copyright.]

ORIGINAL ARTICLES— Page.
An Address, by A. C. Thomas .. 573
Blood Group Frequencies in Hollanders, by J. J. Graydon, R. T. Simmons and E. F. Woods .. 576
Observations on Human Leprosy: Infection of Rats with Human Excretal Organisms, by J. W. Fielding, F.R.M.S. .. 578
The Botany of Toowoomba and Environs and its Relation to Clinical Allergy of the Upper Respiratory Tract, by Charles R. Morton .. 585

REPORTS OF CASES—
Sudden Death following Initial Injection of a Mercurial Diuretic, by Alex Murphy, F.R.A.C.P. 589
Latent Primary Breast Tumour, by T. R. Gaha .. 590

REVIEWS—
The Health Problems of Eastern Pacific Countries 591

LEADING ARTICLES—
A Report from Great Britain on a Comprehensive Dental Service .. 593

CURRENT COMMENT—
Convalescence after Surgical Procedures .. 594
Unusual Œstrogen Reaction in a Boy .. 595
Bone as Human Food .. 595
Dr. J. G. Hunter Flies to England .. 595

ABSTRACTS FROM MEDICAL LITERATURE—
Surgery .. 596

BRITISH MEDICAL ASSOCIATION NEWS— Page.
Annual Meeting .. 598

SPECIAL CORRESPONDENCE—
London Letter .. 603
Canadian Letter .. 604

NAVAL, MILITARY AND AIR FORCE—
Appointments .. 605
Casualties .. 606

CORRESPONDENCE—
"Non-Take" Spinal Analgesia .. 606
Too Many Doctors? .. 606
"Atebrin" and Dermatitis: An Inquiry .. 607

POST-GRADUATE WORK—
Programme of Courses in Sydney for 1946 .. 607

NOMINATIONS AND ELECTIONS .. 607

THE FEDERAL MEDICAL WAR RELIEF FUND .. 607

OBITUARY—
George Murray Anderson .. 608

MEDICAL APPOINTMENTS .. 608

BOOKS RECEIVED .. 608

DIARY FOR THE MONTH .. 608

MEDICAL APPOINTMENTS: IMPORTANT NOTICE .. 608

EDITORIAL NOTICES .. 608

An Address.[1]

BY A. C. THOMAS,

President of the New South Wales Branch of the British Medical Association.

FIRST I wish to thank the members of the New South Wales Branch of the British Medical Association for the honour they have conferred on me in electing me to the chair—an honour which is appreciated the more when one regards, at the end of this hall, the array of portraits of previous presidents. The ethical plane of the practice of medicine in this State is very high, and this fine standard owes much to the example and work of these men and their colleagues on the various councils throughout past years—men known and trusted in their profession, to whom we owe a debt for their considerable share in maintaining the strong foundations and high traditions of this Branch. We recognize a duty and an obligation to them and to ourselves to maintain those professional standards of ethics and practice in a world shaken by radical political, social and economic theories, changes and portents. The war has ended, but great conflict of opinion in many spheres goes on. It is a disturbed and disturbing period of time, an age of destruction and change, but also, let us constantly remind ourselves, a dynamic age, an age of great discoveries and advances in human knowledge, of achievement, of reconstruction and new construction, wherein we may participate, doing our part with a good will, an earnest mind and zeal, and seeking truth and knowledge and guided by experience. Thus, too, in the special field of medicine shall we best play our part.

[1] Read at the annual meeting of the New South Wales Branch of the British Medical Association on March 28, 1946.

The immediate years ahead will be charged with significance for the future of the medical profession. What is done or not done in this period of stock-taking, planning and replanning, of cooperation or of non-cooperation, will determine probably the type of medical service to be provided for our nation for some considerable and important period of time. During all our deliberations and actions, then, may we bear in mind those honourable traditions which put service to our science and to our patients before any selfish thought or desire. Our calling is necessarily altruistic. It demands from the practitioner his best talents and self-abnegation.

At this juncture I wish to pay tribute to the ranks of civilian practitioners, depleted heavily in numbers during the war years, working long hours, without rest or vacations and without thought of commensurate material reward. Special acknowledgement is due to those who in various ways helped to preserve the interests of colleagues on service. The civilian practitioner, however, would be the last to complain of his lot or take any credit for his sacrifices, for he ever remembers the work and the sacrifices of his colleagues in the forces.

The story of the medical services in this last war continues the noble story of such work in previous wars. A number of the members of the profession made the supreme sacrifice, and we honour their names. They went out full of hope, enthusiasm and stern resolve, desiring only to do their duty and to serve. They will not return to take their places amongst us; but we will remember them. Our thoughts and deepest sympathy go to those who have been bereaved.

Many of our colleagues, more than in previous warfare, became prisoners of war. To those who are back with us, we offer our congratulations upon their release and our commendation and thanks upon the great service given by them during their captivity, in spite of severe, often almost incredible, privations and damage to health and always under the greatest difficulties. The full story of

their selfless devotion and high achievement has yet to be written.

Tonight I wish to emphasize the prime importance of giving our most earnest attention to the needs of all our service colleagues and our personal responsibility towards them. Approximately nine hundred members of the profession from this State enlisted in the forces. Available statistics warrant the assumption that more than 50% of this number were men who joined the services within two years of graduation, who have never been in practice, some of whom have not had one year's hospital experience, and a number of whom are married, some with small families. The majority of these men will be entitled to certain rehabilitation privileges, which have been fully set out in the manual issued by this Branch in conjunction with the Post-Graduate Committee in Medicine in the University of Sydney.

It is, however, after the period of his scientific rehabilitation has been completed, that the material problems of the demobilized medical officer will begin. He will be feeling the need for reasonable security. He will be conscious, as we all are, that this present time will witness critical decisions bearing forcibly upon the organization of medical services and influencing their present state and future destiny. It will be the duty and privilege of more established and senior colleagues to help bring about security and reasonable prospects for such men; to exemplify the guiding principles of their calling; and because these men will be keen, youthful, poised, and modern in outlook, to reveal knowledge of, and interest in, the impressive advances of medical and surgical achievement within our age and at this present time. It must be realized that the medical profession is not reactionary or conservative in its attitude towards the demands advocating and securing improvements in social and economic conditions generally, and particularly as affecting national health services, but has shown on many occasions its interest and activity in these matters.

Remembering these obligations, I now feel it my duty to mention some of the pressing topics which will confront these ex-service officers and to state some of my own personal findings and beliefs, hoping at the same time to retain your interest and sympathetic hearing.

Within a short time the medical profession in Australia, as in Britain, will be faced with a difficult problem. It is one which will have the keenest interest for us all and particularly for those men about to begin their active professional career in civilian life. Almost certainly legislation will be introduced to institute some form of nationalized medical service for Australia. Security, leisure and pensions will be features held out to the doctors as outstanding advantages of such a system. But I urge a warning that due consideration be given to the values which may be lost or submerged if the form of service offered is accepted. The three main types of nationalized service are (i) a contract system, (ii) a fee for service system and (iii) a salaried service. At present it would appear that the only form of service being considered by our legislators is the salaried service. Let us for a short time discuss some aspects of such a service.

The standards of any medical service, nationalized or not, must be gauged (i) by the efficiency of the service it gives to the public, (ii) by the degree of professional proficiency maintained, and (iii) by the effect it has upon the individual doctor physically, spiritually, mentally and morally. These three interests—those of the public, the medical profession and the doctor—are interrelated, the one depending on the other, and must be paramount in the consideration of any system. British medicine has been developed upon three essential principles: (i) that indefinable something, the doctor-patient relationship; (ii) freedom of choice for doctor and patient; (iii) freedom of judgement, action, speech and writing for the doctor in the practice of his profession. To me, and I believe to the majority of our members, it seems that the maintenance and retention of these principles is impossible in a salaried service, if only because of the bureaucracy inherent in its implementation and administration, which inevitably results in loss of individual freedom, of initiative and of sense of responsibility. Bureaucracy, it has been said, "by its very nature is antipathetic to genius, courage and initiative and every other virtue of individualism". It can work smoothly only in the hands of mediocrity, if then, and its tendency is toward a levelling down of intellect and ideals rather than an elevation. It sets limitations, which spell the degradation of the citizen subject. Moreover, it is my firm opinion that present trends in legislation, precluding reward for merit and efficiency, are against biological laws. In Russia a whole people has been submitted in our time to such an experiment by fervid revolutionaries, and the working out demanded the abandonment of this theory and the institution of recognition for merit and ability. In our own national civilization, enlightened minds have admitted always that full freedom is necessary to the individual in his spiritual experiences, his mental resolves and decisions, his search for knowledge and its proper application, and that he must in these matters be unhindered by rules, regulations and other bureaucratic forms of control, always with the exception of those necessary for the good order of society.

All responsibly-minded citizens will agree that it is the duty of the State to care for those who are unable to care for themselves, to protect the less efficient from exploitation and to ensure their proper access to reasonable and necessary services. But the exercise of this duty does not need to destroy healthy individualism, which is an indispensable quality in a sound and properly functioning democracy.

Many profound thinkers have given their minds to these questions, and I would instance Lord Hewart and Professor Hayek, who, in "The New Despotism" and "The Road to Serfdom" respectively, have shown conclusively that the modern trend towards bureaucratic control and enforced plans must lead inevitably to a totalitarian State.

In the interests of the public, of the high standards of the medical profession, and of the individual doctors, it appears to me a duty to withstand such influences. I feel I speak for the great majority of the profession when I urge all members, and especially those now faced with adaptation to civilian practice, not to surrender their guardianship of the fundamental principles of their profession, however soothing the baits of a salaried service may seem, and to remember that "those who would give up essential liberty to purchase a little temporary safety deserve neither liberty nor safety".

I think I can safely claim that the majority of the organized profession, while opposed to a salaried service for just such reasons as I have given, believe in the possibility of a national health service incorporating all the advantages of intelligent and informed planning without the destroying disadvantages of a bureaucratic system. The British Medical Association has always been interested, not only in the pure science of medicine, but also in the sociological, political and economic questions affecting the method and scope of their professional service. A live interest in public health as well as in pure science is recorded and evinced in the long and illustrious history of study, research and teaching of medicine and its application to the service of mankind, and notably within the crowded annals of recent decades.

In our present time, and not least in the medical profession, there is widespread interest in improved national health measures and elimination of disease. Representatives of our Association in discussion with parliamentary representatives have indicated deep interest, wide scope and practical soundness of recommendation and suggestion, and a desire for legislative support. They have stressed the need for proper environment, better housing, maternal and child welfare, proper foods, removal of drudgery and fatigue, maintenance of adequate wages, more day nurseries, crèches and kindergartens; for enough playgrounds and recreational areas, regular medical supervision of school children; for practical measures for immunization against disease; for more assistance in the

eradication of tuberculosis; for construction and extension of hospitals on a decentralized plan with full supply of all necessary departments; for more beds for patients with subacute and chronic diseases; for extension of aerial services—doctors, nurses and ambulances; for inducements to medical men to serve outback areas; for increased assistance to post-graduate education; for increased popular education; for more assistance to universities for teaching and research, with special research into industrial medicine and prevention of disease and injury in industry; for establishment of a chair of social medicine; for all possible assistance to preventive medicine and insistence on its place in a study of national health; for representatives of medical science on national councils of health; for adequate clinics for venereal disease.

This is a brief and incomplete *résumé* of important subjects discussed, but it is enough to support the contention that the medical profession through our Association has conferred cooperatively and soundly with our legislators, whose benevolent concurrence in ideals and promised attention to practical action in such domains are, so far, outweighed and obscured by their zealous planning of a scheme for regimenting the profession as a prime step to a national health service.

You have had my criticisms on the salaried service scheme, so I shall proceed.

It is not necessary to detail the obvious disadvantages of a contract system, but it does appear that the "fee for service" system could be considered and might be implemented without any necessity for a control, either medical or lay—for let me interpolate here, I would fear a medical hierarchy just as much as a lay bureaucracy. The British Medical Association has evolved a system of insurance, which at present is being held up by legal difficulties. This insurance scheme of the Association would encourage thrift and providence in the community and help to develop the traits of independence and self-reliance in the nation. The "fee for service" system, and especially that modification of it known as the "rebate" system, wherein the patient pays a small proportion of the doctor's fee, seems to me to be the only type of nationalized service which can be considered favourably as judged by and in the interests of the public, the medical profession and the doctor, and which will retain those essential principles of freedom previously enunciated. It is the only system that the profession as doctors and citizens can in the light of their science and practice of medicine and with a sense of civic responsibility, examine at all favourably.

One of the most disconcerting aspects in all these discussions is the apparent apathy and silence of the members of the public, who are themselves vitally concerned and whose opinions wield immense power. The people do not seem to have realized all the implications of the theories and promises in the proposed salaried service, or to have followed the achievements and suggestions from within the profession towards sound and progressive national health service.

In the meantime, until an alternative scheme to the proposed salaried service suggested by political circles is adopted, one based on the best standards and genuine needs of both the medical profession and the public, there is a duty to be observed by the established members of the profession to the demobilized medical officers and young graduates, and in some important respects, to themselves in general. Without discouraging the development of a sturdy independence and individualism amongst ex-service medical officers, established practitioners have a duty to assist them to security and to help make the pursuit of their profession more congenial in actual practice. This will involve some reorganization among the practising members of the profession and the sinking of any selfish rivalries or petty advantages, if they exist. The need for reform and progress is always with us. It is better to institute it than to have it forced on us from without.

It cannot be denied that modern general practice demands more output of energy and sacrifice of leisure from the doctor than in earlier decades. There was a time when most doctors had moderate leisure and time to devote to the study and contemplation of the liberal arts and sciences. Today little time seems to be left for other interests and cultural development, or even for the needs of ordinary recreation. It is ironical, but nevertheless true, that two great modern inventions, the telephone and the motor-car, which have been of great service to man in general, have also been main causes of the deprivations in a doctor's life. An added factor in the strain upon the doctor, and not so Gilbertian as it sounds, is the greater enlightenment of the public due to popular education, together with the great advances in medical knowledge. "An enlightened community demands and breeds good doctors", says Warbasse in "The Doctor and the Public"; but this also extends the scope and burden of practice. One can only make passing reference to these influences in their effect upon professional existence.

Reflection is forced upon us, however, that they, together with the modern economic revolution, compel an awareness that the position of the practising doctor, if he is to have a reasonably sound mind and body, needs examination. Further, the high incidence of income tax, which will continue apparently for some time yet, must make every doctor consider the question of economic security. It will be obvious that one way in which the young graduates and commencing practitioners may be helped, is by senior members taking assistants or partners when this is possible and desirable. The loss in net income of an established doctor will be seen to be small, after due study of income tax effects, and the extra comfort and efficiency of practice will more than compensate for any decrease in net income. The practical importance to the younger man is obvious.

Another aspect of practice which cannot be ignored at the present time, and for which there does not seem to be any immediate relief, is the difficulty of procuring sufficient domestic help. The indication is that in the future medical practice may of necessity be conducted away from the homes of doctors. This leads to another conclusion and suggestion. A method of practice successfully tried and to be commended for the above-mentioned reasons, is one in which a group of doctors practise in one building, sharing attendance and each conducting his general or specialized practice. With mutual agreement and interchange of free periods, with rosters by agreement or with special provinces of work, each man would have more leisure for recreation and cultural pursuits, less fatigue, better health and a generally improved responsiveness to life and work. Thus, through assistantships, partnerships or group practice, the younger men or any commencing practice may plan for themselves or be assisted by established men with benefit to all parties. The consideration that the value of the goodwill of practices has been affected materially by the high incidence of income tax should always be taken into account in the assessment of such values. Although Medical Finance, Limited, can give assistance in approved transactions, it would help greatly if senior members would when possible assist their junior colleagues to budget. Finance for commencement of practice is one of the young doctor's greatest problems. It is a duty and obligation on senior members to ease his burden as much as possible.

Such considerations as have been presented tonight have been touched on lightly enough, because of the wide range covered. Some statements and suggestions you may consider moralizing or provocative and debatable; but I have felt it a duty to state humbly and earnestly something of my faith and personal opinions, and especially to lay emphasis on the position of demobilized men and new graduates, as also on the opportunities for constructive personal cooperation on the part of senior colleagues.

On the clamouring questions relating to planned service, I repeat my warnings against acceptance of suggestions or plans vitally affecting the future history and status of medical service in this country, unless they conform to the principles which I have enunciated previously, and which govern the best interests of the public, the medical profession and the doctor.

BLOOD GROUP FREQUENCIES IN HOLLANDERS.

By J. J. Graydon, R. T. Simmons and E. F. Woods,
from the Commonwealth Serum Laboratories, Melbourne,
in collaboration with
C. Lumkeman,
from the Royal Netherland Indies Forces, Melbourne.

Advantage was taken of the presence in Australia of an unusual number of Dutch nationals from Holland and from the Netherlands East Indies, to conduct a blood-grouping survey covering the A-B-O-, the M,N and the Rh agglutinogen systems on a small but representative sample of this population. Similar surveys have been made at these laboratories on other races—namely, Australian aborigines, Papuans, Indonesians, Fijians, Maoris, Filipinos, Japanese and white Australians, the results being reported in a series of short papers appearing in this journal.

Our interest in the blood-group frequencies present in the Netherlands had been aroused by the fact that the only figures published for the M,N types in Hollanders were unusual, and on statistical grounds probably unreliable, whilst no data on the Rh factor were available to us for this race.

In this series we examined the subtypes of the Rh factor as completely as the available sera would allow. At the time of testing we had an adequate supply of anti-Rh° serum, only very limited supplies of anti-Rh′ and anti-Rh″ sera and none whatever of the anti-Hr types of serum.

Material and Methods.

The blood samples were collected by one of us (C.L.) in Australia from 200 adults of Dutch parentage, born in various parts of Holland. They were obtained in seven lots, over a period extending from August, 1944, to the end of June, 1945. All but 21 of the persons from whom blood was taken were males, and no close relatives were included in the group.

From each subject two drops of blood were collected into modified Rous and Turner solution (Simmons and Graydon, 1945) and the samples were forwarded to the laboratory, without ice packing, by the quickest available route. The 36 samples collected in Brisbane were delayed several days before being forwarded to Melbourne by air, and of these two were rejected because of partial lysis, though the cells reacted sufficiently well to be typed. The remainder of the samples were tested shortly after their collection in Melbourne.

The tests for the groups, the sub-groups, the M,N types and the Rh factor were carried out by the slide technique as described by us in previous papers.

After the first seventy samples had been examined, we received from the United States of America small samples of anti-Rh′ and anti-Rh″ sera enabling the subtypes of the Rh factor to be determined. Towards the end of the investigation further samples of anti-Rh′ and anti-Rh″ sera were received from England. The final 18 samples were tested with the English sera.

Results and Discussion.

The group percentages which are presented in Table I are similar to those reported previously for Hollanders. Approximately 20% of subjects of blood A and AB belonged to the sub-groups A_2 and A_2B respectively. We have not seen any previous figures for the distribution of the sub-groups of A in the Dutch population, but these findings are in close agreement with those reported for English, Danes, Germans and white Americans.

The M,N type percentages in the present series are not significantly different from those of other Western European races, though they differ greatly from the figures reported by Postmus (1934) (Table II). On statistical and other grounds one might assume that the latter's unusual results were due to the inability of his testing fluids to react satisfactorily with some of the cells, which were heterozygous with respect to the M,N system.

The reactions given by the samples with the three anti-Rh test sera are shown in Table III. The classification into subtypes according to Snyder's (1945) modification of Wiener's nomenclature is used, and the possible genotypes which give these reactions (the rare genes Rh_1 and Rh_y being omitted) are shown in the last column of the table. Values for the frequencies of the genes which have been calculated to give a close fit to the experimental data are shown at the foot of the same table. If these frequencies are assumed to be in a homogeneous population, the number in each Rh subtype to be expected according to genetic theory can be calculated (see fifth column, Table III). These values can then be compared statistically with the actual findings to determine the closeness of fit of the gene frequencies to the experimental data. In this instance $\chi^2 = 2{\cdot}43$ for one degree of freedom,

Tabl I.
Blood Group Frequencies in Hollanders.

Number Tested.	Number and Percentage of Groups.						Frequency of Genes.[1]				D/σ_D.
	O	A_1	A_2	B	A_1B	A_2B	p_1	p_2	q	r	
200	93 (46·5%)	61 (30·5%)	18 (9·0%)	18 (9·0%)	9 (4·5%)	1 (0·5%)	0·182	0·063	0·063	0·682	1·3

[1] The gene frequencies were derived from the equations:

$$p_1 = \sqrt{\frac{O + A_1 + A_2}{100}} - \sqrt{\frac{O + A_2}{100}}, \quad p_2 = \sqrt{\frac{O + A_2}{100}} - \sqrt{\frac{O}{100}}, \quad q = \sqrt{\frac{O + B}{100}} - \sqrt{\frac{O}{100}}, \quad r = \sqrt{\frac{O}{100}}$$

$$D = 1 - (p_1 + p_2 + q + r).$$

Table II.
M,N Percentages in Hollanders.

Author.	Number Tested.	Number and Percentage of Types.			Frequencies of Genes.		D/σ_D.
		M	MN	N	m	n	
This survey	200	47 (23·5%)	97 (48·5%)	56 (28·0%)	0·478	0·52	0·4
Postmus (1934)	133	49·0%	17·5%	33·5%	0·578	0·42	6·43

TABLE III.
Rh Blood Types in 130 Hollanders.[1]

Rh Bloodtype	Reaction with Antisera.			Observed Number.	Observed Percentage.	Expected Percentage.	Possible Genotypes.
	Rh°	Rh′	Rh″				
Rh°′	+	+	−	67	51·5	52·1	Rh°Rh°′, Rh°Rh′, Rh°′rh, Rh°′Rh″, Rh°′Rh′.
Rh°″	+	−	+	16	12·3	15·7	Rh°Rh°″, Rh°Rh″, Rh°″Rh″, Rh°″Rh″, Rh°″rh.
Rh°′Rh°″	+	+	+	23	17·7	13·8	Rh°′Rh°″, Rh°′Rh″, Rh°″Rh′.
Rh°	+	−	−	2	* 1·5	1·6	Rh°Rh°, Rh°rh.
Rh′	−	+	−	2	1·5	1·6	Rh′Rh′, Rh′rh.
rh	−	−	−	20	15·4	15·2	rhrh.

[1] Gene frequencies: Rh°′ = 0·41, Rh°″ = 0·16, Rh° = 0·02, Rh′ = 0·02, rh = 0·39.

giving a value for p of 0·12, which indicates that the calculated gene frequencies fit the data reasonably well.

As the result of a personal communication received from Dr. A. S. Wiener, we now believe that the value given for subtype Rh°′Rh°″ is higher than it should be, owing to the use during the first part of this survey of an anti-Rh′ serum which was not completely specific. Such a serum would, in effect, increase the number of samples reported as of subgroup Rh°′Rh°″ at the expense of some which really belonged to subgroup Rh°″. In Table IV the distribution of the blood types of the Rh factor in the Dutch is compared with that in other races; this table reveals both striking similarities and marked differences. The white races so far examined all give a very similar picture. However, it may well be that when other white races—for example, southern Europeans, Finns, Slavs *et cetera*—are investigated, wide differences in the distribution of Rh types will be encountered.

It is in the coloured races that one finds such gross differences in the frequencies of the various types.

The study of the racial distribution of the Rh blood types is only in its infancy; but it is obvious from Table IV that this study, if energetically pursued, will be of great importance in furthering our knowledge of racial origins. There are now at least fifteen genes governing blood-grouping reactions, which with potent sera can be objectively determined without ambiguity.

The value of this weapon in the fields of human anthropology and ethnology should not be overlooked when future investigations on living subjects are being planned.

Acknowledgements.

We are extremely grateful to Dr. A. S. Wiener, of the United States of America, and to the late Dr. G. L. Taylor, of England, who kindly spared us samples of the rare anti-Rh′ and anti-Rh″ sera which have been used in this investigation.

Summary.

1. Blood samples from 200 natural-born Hollanders were examined for the blood properties A_1, A_2, B, O, and M,N.

2. Of these, 46·5% belonged to group O, 30·5% to subgroup A_1, 9·0% to subgroup A_2, 9·0% to group B, 4·5% to subgroup A_1B, and 0·5% to subgroup A_2B.

3. There were 23·5% of type M, 48·5% of type MN and 28·0% of type N. These figures differ greatly from those reported previously by Postmus, who found 49%, 17·5% and 33·5% in types M, MN and N respectively.

4. In tests for the Rh blood types on 130 of the samples, 51·5% were found to be of type Rh°′, 12·3% of type Rh°″, 17·7% of type Rh°′Rh°″, 1·5% of type Rh°, 1·5% of type Rh′ and 15·4% of type rh.

5. The frequencies of the Rh blood types in Hollanders are compared with those found in other races.

Bibliography.

S. Postmus: *"Onderzoekingen naar het Voorkomen der Bloedtypen M en N van Landsteiner en Levine in Nederlandsch-Indie", Geneeskundig Tijdschrift voor Nederlandsch-Indie*, Volume LXXIV, July 3, 1934, page 1416.

R. R. Race: Personal communication, June, 1945.

R. T. Simmons and J. J. Graydon: "Blood Groups, Subgroups, M.N Types and Rh Subtypes in Filipinos", THE MEDICAL JOURNAL OF AUSTRALIA, Volume II, September 15, 1945, page 325.

R. T. Simmons, Rachel Jakobowicz and G. A. Kelsall: "The Rh Factor: A Survey of the Subtypes of White Australians", THE MEDICAL JOURNAL OF AUSTRALIA, December 29, 1945, page 493.

L. H. Snyder: "The Nomenclature of the Rh Blood Types", *Science*, Volume CI, January 19, 1945, page 62.

R. K. Waller and P. Levine: "On Rh and other Blood Factors in Japanese", *Science*, Volume C, 1944, page 453.

A. S. Wiener, R. B. Belkin and E. B. Sonn: "Distribution of the A_1-A_2-B-O, M-N, and Rh Blood Factors among Negroes in New York City", *American Journal of Physical Anthropology*, Volume II, New Series, June, 1944, page 187; "Distribution and Heredity of the Human Blood Properties, A, B, M, N, P and Rh", *The Journal of Immunology*, Volume L, June, 1945, page 341.

TABLE IV.
Rh Blood Types in Various Races.

Population Studied.	Authors.	Number Tested.	Rh Types and their Reactions with Anti-Sera Rh°, Rh′, Rh″ respectively.							
			Rh°′ ++−	Rh°″ +−+	Rh°′Rh°″ +++	Rh° +−−	Rh′ −+−	Rh″ −−+	Rh′Rh″ −++	rh −−−
Hollanders ..	Present survey	130	51·5	12·3	17·7	1·5	1·5	—	—	15·4
Australian Whites	Simmons *et alii* (1945) ..	350	54·0	12·6	16·6	0·6	0·9	0·6	—	14·9
American Whites	Wiener *et alii* (1945) ..	1,468	54·4	13·7	15·0	2·4	1·0	0·2	—	13·3
English	Race (1945)	927	54·9	12·2	13·7[1]	2·5	0·6	1·3	—	14·8
Mexican Indians	Wiener *et alii* (1945) ..	98	48·0	9·2	41·8	1·0	—	—	—	—
Negroes	Wiener *et alii* (1944) ..	223	20·2	22·4	5·4	41·2	2·7	—	—	8·1
Asiatic Indians	Wiener *et alii* (1945) ..	156	70·5	5·1	12·8	1·9	2·6	—	—	7·1
Chinese	Wiener *et alii* (1944) ..	132	60·6	3·0	34·1	0·8	—	—	—	1·5
Japanese	Waller and Levine (1944)	150	37·4	13·3	47·3	—	—	—	0·7	1·3
Japanese	Miller and Taguchi. (*After* Wiener, 1945)	180	51·7	8·3	39·4	—	—	—	—	0·6
Filipinos ..	Simmons and Graydon (1945)	100	87·0	2·0	11·0	—	—	—	—	—

[1] This figure includes $Rh°'Rh_z$ of 0·11%.

A. S. Wiener, J. Preciado Zepeda, E. B. Sonn and H. R. Polivka: "Individual Blood Differences in Mexican Indians, with Special Reference to the Rh Blood Types and Hr Factor", *The Journal of Experimental Medicine*, Volume LXXXI, June 1, 1945, page 559.

A. S. Wiener, E. B. Sonn and C. L. Yi: "Blood Groups, Subgroups, M-N and Rh Types of Chinese", *American Journal of Physical Anthropology*, Volume II, New Series, 1944, page 267.

A. S. Wiener, L. J. Unger and E. B. Sonn: "New Data on the Distribution of the Rh Blood Types", *Proceedings of the Society for Experimental Biology and Medicine*, Volume LVIII, 1945, page 89.

OBSERVATIONS ON HUMAN LEPROSY: INFECTION OF RATS WITH HUMAN EXCRETAL ORGANISMS.

By J. W. Fielding, F.R.M.S.,

School of Public Health and Tropical Medicine, University of Sydney.

A search of the literature reveals that throughout the ages to the present time, there has been considerable confusion with regard to many dermatological conditions and human leprosy. In spite of the extensive work done on human leprosy, Rogers[16] considered that little progress in its reduction had been made. The easier experimental approach has caused leprologists to concentrate on the elucidation of the ætiology of rat leprosy; they have considered that light thrown on this would be reflected on the human condition.

Some observers consider that primary inoculation establishes sensitivity to subsequent dosing and produces larger lesions and shorter incubation periods. However, others claim the opposite—that primary inoculation produces smaller lesions associated with longer incubation periods and subsequent immunity of the animals. Sabrazes, De Langen, Vespoli and Rogers have all suggested that superinfection was a necessity for the production of generalized infections. My observations in rats give support to this view and also reveal the necessity for highly viable organisms to be used before resistance can be broken down and infection result.

My attempts to produce a generalized infection of rat leprosy by first creating a local artificial mobilization of leucocytes and following this by a single inunction of highly viable bacilli have been so far unsuccessful.

Ectoparasites have been suggested as links in the transmission of human leprosy, but convincing records are not available. Long has associated bed-bugs with a case from a deserted leper hut, but subsequent control of the case was lacking. Organisms have been found in various insects including mosquitoes.

Vedder's experiments with *Aëdes ægypti* gave negative results, and his findings gain support from the non-infection of attendants at Peel Island, Queensland, where, according to Cilento, mosquitoes were plentiful. Infection of rats without the production of superficial lesions, but associated with the presence of organisms in various glands and organs, has been effected by various workers by feeding various insects, including lice and mites, on the animals. Similar infections have resulted in my series after inunction and subcutaneous inoculation of emulsion of lice and mites on a single occasion. It would appear that repeated feeding or treatment with infected lice emulsions would result in superficial as well as deep internal lesions. That infected rat lice fed on rats and guinea-pigs are capable of producing inflammatory thickenings appears to be evidence in favour of increased ability to invade gained during the sojourn of bacilli in the lice.

Digestive and Urogenital Infections.

Rogers and Muir[17] have suggested that organisms found in the stools of patients have been swallowed from some local lesions and are a possible source of new infections. Mitsuda found lesions of a light character in the œsophagus, intestines and stomach. These findings emphasize the importance of the present work. Little attention appears to have been given to searches for organisms in the excreta of leprous patients. Hollman carried out several hundred examinations on the fæces of four patients with nodular leprosy, with negative results; similarly he examined the urine of 48 patients with nodular leprosy with positive results in eight intances. Radna[15] examined the urine of a series of patients with negative results; after "Novarsenobenzol" injections he obtained positive results in nine of these cases. Berny obtained similar positive results in rat leprosy, using the same method in rats. Lagane[9] found organisms in the urine of human patients. Pereira and Anderson, in an examination of the gastric contents and urinary sediment of 55 human patients with mixed infections, found organisms in eleven examples of each; they considered the stomach and kidney functions impaired.

I have found[5] that the digestive and urogenital systems of leprous rats could be highly infected, and that the organisms from these sites played a major role in the dissemination of the disease of rats. It was therefore decided to examine the excreta of human patients. Fifteen patients from the New South Wales Leprosarium were examined and organisms were found in the urine of one patient with nodular leprosy and in the fæces of another. A third patient, suffering from mixed leprosy, was found to have organisms in both the fæces and urine; this was a chronic infection, and the patient died some three months later. The two nodular cases are of considerable importance; these patients showed comparatively little evidence of the disease, but passed organisms in the excreta, one passing large numbers in the fæces, the other in the urine. In these two cases it is important to note that the signs were receding; by inunction organisms from these patients produced slight intracellularity of bacilli in the skin and a light infection of some of the organs of the rat. This finding, together with the results of previous experiments demonstrating generalized infection of rats with Stefansky's bacillus from the excreta, reawakens the whole question of the carrier problem for the human disease. Such organisms associated with bad sanitation and suitable climatic conditions might well be a potential danger. Furthermore, these findings tend to throw a new light on Ashburton Thompson's[24] statement on spontaneous leprosy; he considered the probability of its transmission to man from his environment rather than from the sick. Cook suggested an extra-corporeal existence for the organisms, and stated "that under such conditions, there would be an evident risk of discharging lepers . . . that there would no longer be any necessity for intimate contact with cases". The proportion of cases due to known contact in various parts of the world is actually on a low level. Cook records 38% for New South Wales and 20% for Queensland. This, in the light of the present findings, would explain why leprosy did not become endemic in Victoria. The patients who arrived in Victoria were in the early stages and showed no signs of digestive or urogenital infections. The disappearance of leprosy after the plague and other epidemics in England and other places may be accounted for by the suggestion that the epidemics were responsible for the death of all leprosy carriers, or perhaps that the cumulative effect of the epidemics was assisted by the destruction, due to winter freezing, of the organisms passed in excreta prior to the epidemics, together with the advent of improved hygienic standards.

Daily Elimination of Organisms in Human Excreta.

Rough smears of excreta are obviously unsuited to estimations of the content of organisms, so the Breed bacteria count was again adopted. Urinary samples were thoroughly mixed in a mechanical shaker, and 0·01 millilitre was transferred by a Breed pipette to a slide; this was spread evenly over an area of one square centimetre. The smears were dried in the incubator, fixed in alcohol, and stained by Ziehl-Neelsen's method. The organisms were counted on a standardized microscope in the Breed manner and the daily calculations were made. Centrifuging of the urine was tried, but the figures were lower. This suggested that centrifuging of the urine did not completely throw down the organisms, and the finding

of bacilli in the residual urine after chloroform treatment proved this.

Fæcal samples weighing one gramme each were emulsified with a glass rod and water; narrow tubes marked at a capacity of 10 millilitres were gradually filled to the mark during emulsification. The tubes were sealed and fastened securely in the shaker for fifteen minutes' shaking. By a Breed pipette 0·01 millilitre of fæcal emulsion was transferred to a slide, spread evenly over an area of one square centimetre and dried in the incubator; fixed by heat and stained by Ziehl-Neelsen's method. Organisms were counted on a standardized microscope and calculations were made daily. Calculations were based on daily evacuations of 170 grammes of fæces and 1,500 millilitres of urine; no allowance was made for probable daily variations in amounts, nor in the water content of the fæces. Later work (to be published) shows that in the rat daily elimination of organisms depends more on ulcerative processes than on the amount of dejecta, and the number passed per day is fairly constant. The variation in fæcal water content may be noted in the following: in case X, one gramme of wet fæces gave 0·12 gramme when dry, in case XI 0·5 gramme of wet fæces gave 0·2 gramme when dry.

Fæcal and soil examinations are sometimes better carried out by a concentration method, such as the saturated sodium chloride method of Willis or the zinc chloride method of Faust. Two grammes of fæces or soil are emulsified with a glass rod with either of the salt solutions in a strong test tube measuring four inches by seven-eighths of an inch; the tube is gradually filled, "topped off" to a meniscus with salt solution and covered with a three inch by one inch slide for twenty minutes. The slide is removed and after a whirling motion it is turned right side up and the fluid is spread evenly. The smear is dried in the incubator, fixed by heat, stained by Ziehl-Neelsen's method and examined for organisms.

Experimental Series.

Fite, using human leproma organisms, obtained most of his positive results after mixing them with gastric mucin. Lampe and De Moor produced rat leprosy by rubbing mud from a rat-run on the scarified skin; later tests were considered to give negative results.

Rat leprosy lesions were produced in my series by superinfection with organisms of rat excreta as well as by a final application of organisms from a primary ulcer. Organisms of excreta from human sources were used in the present series. Some rats became mildly infected, organisms being found in internal organs without external manifestations; others showed evidence of immunological activity. The work seems sufficiently encouraging to justify presentation.

It would appear highly desirable to carry out similar experiments with organisms from human patients with digestive or uro-genital infections, or both, before the organisms have been attenuated by chaulmoogra or other treatment. The maculo-anæsthetic infections of man may perhaps arise like the glandular infections of rodents as products of early invasions, but where contact with organisms has been temporarily broken. Since advanced rat leprosy with superficial lesions has been produced by superinfection with excretal organisms, it appears desirable in the case of human leprosy to test this by reestablishing and continuing contact with organisms of human excreta on the early maculo-anæsthetic sites. It has been impossible to complete the present series of experiments owing to the difficulty of obtaining regular supplies of fresh infected excreta, because of "inimical" storage conditions and because of the effects of drug treatment of the patient on the organisms before their elimination from the body.

Series A: Subcutaneous Hypodermic Inoculation.

In the first series human leprosy material was given by subcutaneous hypodermic inoculation.

On the first day ten rats were injected subcutaneously with fæcal emulsions or urine; two of those injected with fæcal emulsion showed œdematous, gelatinous spreading lesions. One of these died on the third day. The lesions of the other ulcerated on the seventh day, and typical organisms were found together with kidney-shaped Gram-positive diplococci. In the remaining animals lesions appeared extending up to five millimetres in diameter by the third to sixth day; all were subsequently absorbed. On the nineteenth day the nine surviving rats were inoculated with similar material or with a mixed urine and fæcal emulsion. By the second to fourth days lesions up to six millimetres in diameter were recorded; one lesion produced by a mixed emulsion ulcerated on the second day and was found to contain typical bacilli; the others were absorbed.

Series B: Skin Slits with Probing.

In the third series skin slits were made and probing was carried out between breast and abdomen, also in the axillary and inguinal regions.

On the 177th day, in rats I, II and V, the cavity made by the slit and probing was filled with mixed human excreta emulsion. On the 180th to 182nd day these rats showed subcutaneous bunches of papular and nodular swellings up to seven millimetres in diameter; all these lesions were subsequently absorbed.

Series C: Experimental Inunction.

In the third series experimental inunction on the intact skin of the breast and on scarified abdominal skin was carried out. The shaven skin of the abodmen was scarified and the emulsion was allowed to flow on with a pipette. Thirteen rats (including the nine mentioned above) were treated with human urinary or fæcal emulsions or with emulsions of mixed excreta.

On the first and 17th days rat IV was treated with fæcal and mixed organisms. On the seventy-third day the rat was killed. No organisms were noted *post mortem*.

On the first and nineteenth days rat VII was treated with mixed organisms. On the one hundred and second day the rat was killed; no organisms were noted *post mortem*.

On the first and eighteenth days rat VIII was also treated with organisms from mixed excreta. On the twentieth day the rat died; organisms were found only on the abdominal skin.

On the first and thirteenth days, urinary organisms were used in treatment of rat IX; on the twenty-eighth day in a skin smear from the abdomen loose organisms were found. On the sixty-first day the rat was killed; no organisms were noted in the skin or organs.

TABLE I.

Details of Human Leprosy Patients Passing Organisms in Excreta.

Case Number.	Nationality of Patient.	Place of Birth.	Period at Home.	Period Abroad.	Present Age. (Years.)	Lesions Appeared at	Type of Lesions.	Lesions at Present.	Breed Count of Organisms.		
									Per Millilitre of Urine.	Per Gramme of Fæces.	Excreted per Day.
I	Australian - born Chinese.	Darwin.	7 years.	China, 7 years.	18·5	17 years.	Nodular.	Slight.	50,000	—	75,000,000
X	Australian.	N.S.W.	8 years.	Nauru, 5 years.	26	13 years.	Nodular.	Nil?	—	1,500,000	250,000,000
XI	Australian.	?	?	?	55	?	Mixed.	Extensive.	28,000 —	— 3,000,000	42,000,000 500,000,000

On the first and twenty-fifth days, urinary organisms were used to treat rat VI. On the sixty-ninth day the rat was killed. Examination of the bladder revealed organisms loose and in one leucocyte; otherwise the organs were normal.

On the first, eighteenth, ninety-seventh, 103rd, 105th, 112th, 120th, 132nd, 149th, 201st and 220th days rat I received inunctions with urinary and fæcal emulsions. On the 113th, 116th and 145th days examination of skin smears revealed loose and intracellular organisms. For the findings on the 116th day, see Figure XI in my paper on rat leprosy[6]. On the 159th and 166th days in inguinal gland washings loose and intracellular organisms were found. On the 233rd day the rat was killed; examination of inguinal glands, other organs and the skin gave negative results.

On the first, eighteenth, ninety-seventh, 103rd, 110th, 118th, 130th, 151st, 200th and 219th days rat II was treated by inunction with urinary and fæcal emulsions. On the ninety-seventh, 103rd, 109th, 112th and 129th days, examination of skin smears revealed loose organisms. On the 159th and 166th days investigation of inguinal gland washings gave negative results. On the 245th day the rat was killed; organisms were plentiful in the liver.

On the first, seventeenth, 114th, 127th, 139th and 152nd days rat III was treated by inunction with urinary and fæcal emulsions. Examinations of skin smears revealed loose organisms on the twenty-eighth day and loose and intracellular organisms on the 124th and 141st days. On the 162nd day in washings of inguinal glands a few loose organisms were found. On the 176th day the rat was killed; no organisms were found in the skin and various organs.

On the first, seventeenth, 113th, 122nd, 134th, 150th, 161st, 211th and 230th days rat V was treated by inunction with urinary, fæcal or mixed emulsions. Examination of skin smears at intervals revealed an absence of organisms. On the 158th day in an inguinal gland washing a fair number of organisms was found. On the 283rd day the rat was killed; in the liver and inguinal and preputial glands numerous organisms were found.

Rats, weighing 50 grammes each, suffering from vitamin B_2 deficiency were fed for nineteen days on Clement's Number 7 diet; while one rat looked normal the others showed varying degrees of depilation.

On the first, sixth, thirteenth, twentieth, twenty-seventh, thirty-ninth and forty-eighth days rats X, XI, XII and XIII received by inunction excreta emulsions made after storage at room temperature for eight months or longer. Examination of skin smears at intervals gave negative results. Inguinal glands were not examined during the experimental period. On the eighty-fourth day the rats were killed. In two no organisms were found. In XI examination of the bladder and the cervical and suprarenal glands revealed fair numbers of organisms and what were considered to be Hoffmann granules. In rat XIII examination of the axillary glands revealed organisms and Hoffman granules.

Metastases and Regional Lesions.

It cannot be doubted that metastasis is responsible for the early infection of internal organs; but it is not quite so clear that such internal organisms are by metastasis responsible for the superficial lesions. This statement is suggested by the finding that regular inunctions of excretal bacilli give rise to lepromata and to an incidental building up of colonies of organisms; but there is no superficial colonizing at other than the original site. Nevertheless, loose bacilli in the skin may be picked up in one or two places. In human leprosy it has been noted that superficial lesions occur chiefly on those parts of the body that are exposed. People wearing European clothing show them usually on the hands and face.

Hansen and Looft hold that no lesions occur on the under surfaces of the hands and feet, while they consider the penis and scrotum to be rarely affected. More recent work has shown that these sites may be diffusely affected. In endemic areas in the tropics, infections of the lower extremities may occur in up to 83% of cases. Muir and also Innes[7] have noted that in rocky country, barefooted people have anæsthetic lesions which are sometimes associated with perforating ulcers. Muir considers that injuries weaken resistance and allow the organisms to gain entrance to the body. Statements have been made that temperature and other conditions causing venous stasis allow the bacilli to settle. Again, it has been stated that extensor surfaces are highly affected, while flexor surfaces and the internal nares are rarely so. Some difficulty is experienced in accepting and appreciating why metastases leave the internal nares and flexor surfaces comparatively unaffected, and similarly why the wearing of boots and clothing excludes such metastatic action. In rat leprosy I have produced lesions on flexor surfaces by superinfection with organisms from the excreta. Infection of the nose has been reported after spraying with organisms.

In this respect some significance is attached to the variability of the reactions, under the following experimental conditions.

1. Various types of leprosy bacilli after subcutaneous injection cause lesions of a temporary character which appear in a few days. These either subside or ulcerate; but in cases in which the inoculum is heavy and the organisms are highly viable, there appear at a later date secondary lesions or true lepromata characterized by limited radial spreading. In this type of infection there is no generalized skin invasion. Neither is there always real evdence at death of generalized internal lesions.

2. Rat lice (*Polyplax spinulosis*), which have fed on infected rats, are refed on clean rats and guinea-pigs on a single occasion, and produce temporary skin infections which persist for variable periods. Internal infection with bacilli is evident in the rats, but not in the guinea-pigs.

3. After simple inunction at single sites with organisms including those from rat lice, localized retention of organisms in the skin of rats and guinea-pigs is noted for varying periods. If the animals are killed at intervals, organisms are found in various organs of the rats, but not in the guinea-pigs. (i) After simple inunction at multiple sites, bacilli are retained at all or most of the skin sites used. Post-mortem findings are similar to those in the second and third series. (ii) After multiple inunction at single or multiple skin sites of rats, after superinvasion in both instances there is an obvious tendency for the organisms to build up their skin tenure; this suggests a gradual breaking-down of local resistance; this later is associated with bacillary intracellularity and with lesions of a permanent character. When animals so affected are kept long enough, they proceed to a generalized internal infection, the stomach, fæces and urine being included. In one such rat, 166 days after the initial inunction, intracellularity of bacilli was found accompanied by small papular lesions. Three small portions of infected skin from the treated area—breast to inguinal region—were cut out and emulsified. The bacterial content of the emulsion was estimated by the Breed bacteria count, and the three pieces were shown to contain some 60,000,000 bacilli. An examination of ten pieces of skin from the untreated parts of the body revealed organisms in only one piece from the back of the head. Fæcal organisms were recovered a few weeks later; this indicated an advanced infection of the rat. This was later proved by a post-mortem examination. Essentially the same condition was found in other rats.

4. Natural superficial and internal infection with rat leprosy of a normal-looking *Rattus norvegicus* was met with. A heavy infestation with all stages of *Ixodes holocyclus* was associated. At the post-mortem examination, organisms were recovered from the axillary and cervical glands as well as from the ear and the skin of the tail.

5. Natural infection may be experimentally stimulated. The animals (eight rats and four mice) were kept in a specially partitioned box, one side containing damp soil contaminated with fæcal organisms from infected rats. At intervals between the eighteenth and eighty-fourth days, an animal was killed and examined. In the four rats and four mice thus examined some or all of the following sites were found to be harbouring typical organisms: the skin at the breast, the abdomen, the tail, the feet, the rump, the genitals and the ear, the brain, liver and spleen, the inguinal, cervical, axillary, preputial and suprarenal glands. Besides these sites, on the eighty-fourth day, some organisms were found in the stomach of one rat. None of these organisms had attained intracellularity. The series will be reported on in detail in a future paper.

It is suggested that early neural lesions of man are like glandular infections of rats—the result of the early invasion of organisms. These organisms disappear before

local resistance is broken down, which might occur if opportunity was given for further invasions. In such neural lesions it has been shown that after incision and scraping of the perineurium organisms may be found associated with the thickened nerves. It has been suggested that the organisms cause nerve degeneration before their migration to internal organs or before they are overcome by the resistance of the subject. Sardjito and Sitanala[13] found organisms in blood smears in neural cases.

Diagnosis of Early Leprosy.

Confusion exists between the early stage of leprosy and certain other pathological conditions. Emphasis has been laid on the early treatment of leprosy, and this suggests the need for a simple diagnostic method which can be used early in the disease. It has been suggested that diagnosis should be made before the organisms spread through the circulation; this, however, in some rats appeared to take place very early after the organisms had invaded the skin. Rogers and Muir pointed out that the mere conveyance of bacilli to the body may not bring about the disease. This has been conclusively demonstrated in my experimental series. Nevertheless, generalized infection is merely a matter of viability of organisms and superinfection. It was noted early in my series that organisms inoculated subcutaneously give rise in two to three days to temporary lesions; these were also produced when hæmolysed blood from leprous animals was inoculated into the same or into fresh rats. Such lesions are not produced by injections of emulsions of tuberculous material or of hæmolysed blood from tuberculous animals or from those inoculated with other organisms.

Injections of hæmolysed blood of rats with advanced leprous lesions result in lesions up to three millimetres in diameter; these may be absorbed or may ulcerate in a few days, and in the latter cases they frequently contain typical organisms; this proves, as others have held, that the blood contained the organisms. I have been unable to find organisms in the skin over those lesions which subsided, neither have they been later found at the injection site. This suggests an early migration of the organisms from the unopened—non-ulcerative—lesions. Such lesions undoubtedly constitute specific reactions. They are large after blood from rats with the disease in virulent form is injected, but show only as small papular lesions after the injection of blood from rats which have been infected with organisms from human excreta or from rats with early leprosy.

Sardjito and Sitanala, Nanba[13] and others have demonstrated organisms in the blood of leprosy patients. This, together with the production of lesions by blood in the present work, suggests the possibility of using the hæmolysed blood of human subjects suspected of having leprosy for early diagnosis by the inoculation of rats. (Mice are not so satisfactory for this purpose.) The technique is simple, little time is required and the rats may be used repeatedly. The blood taken as aseptically as possible is mixed with sterile water in the proportion of one part to three and inoculated subcutaneously in quantities of 0·6 millilitre. The inoculum is usually absorbed by the next day, and by the second or third day a small, hard, papular lesion is present which reaches its maximum by the fourth or fifth day. The lesions may remain unaltered for a couple of days before either being absorbed or ulcerating; in the latter case they are sometimes found to contain organisms. Sardjito and Sitanala ask: "How far are we justified in assuming that the acid-fast bacilli we found in blood were lepra bacilli?" Simultaneous tests of their slide method and this inoculation method are herewith suggested to answer this question.

Discussion on Various Terms and Leprotic Conditions.

The incubation period in leprosy is uncertain. It is sometimes calculated on the appearance of lesions of a temporary character. From my observations it should be calculated only on the appearance of permanent lesions—that is, lepromata—and of pronounced intracellularity of superficial organisms. When the calculation is made for anæsthetic patches, this is usually stated. Some records show incubation periods up to twenty or more years, but Muir and Ryrie respectively record the appearance of leprous lesions in children three months and forty-eight days from birth. Dew[4] records depigmentation and anæsthesia of an abraded elbow after a cycling accident; this subject one month previously showed no signs of leprosy. The nature of the accident and the short incubation period suggest a soil infection. Patients requiring readmission to hospital may also have suffered soil infection, and therefore they may have continued re-infections rather than recurrences. Austin, in considering readmissions to hospital, thought that the lesions should not be regarded as recurrences, since some patients did not show reactivation of leprotic processes. Dew's soil infection, together with infection of rats by human excretal organisms, raises the question of a definition of endemic areas. Is endemicity decided by the fact that the soil is contaminated by organisms from excreta and not by a chance concentration of cases? It has been suggested that the incubation period depends on the virulence of the organism; the latter in my experience appears to be built up by superinvasions of highly viable bacilli and shows as true intracellularity of the organisms. In other pathological conditions, intracellularity is merely characteristic of phagocytosis; but in leprotic conditions it is undoubtedly associated with multiplication of bacilli. Leprosy may be obscure and gradual in its onset, passing the early stages even before neural patches appear; frequently there is a sudden appearance of widespread nodules or of erythematous or hypopigmented patches which may be anæsthetic or non-anæsthetic. In New Caledonia the first local case of leprosy appeared one year after the arrival of the original Chinese patient; ten years later almost half the population was considered infected. Generally these observations point to a shorter incubation period.

Other terms used in leprosy need careful examination. Two particularly unfortunate terms are "natural selection" and "racial immunity". Most of these terms have an assumed rather than a real value and may depend on the presence or absence of a really infective type of organism. It has been noted that even debilitated contacts fail to contract leprosy. This may be because of some unknown factor. This unknown factor may be the same as Ashburton Thompson's environmental agent and may prove to be the presence of infected excreta. This would explain Thompson's spontaneous human leprosy.

Thinness of the skin and superinfection, rather than physiological conditions, have been suggested as factors in comparative susceptibility, children being considered more susceptible than adults. While superinfection is an undoubted factor, neither of the other contentions is upheld; there is considerable evidence that young adults are equally as or more susceptible than children. Experimental evidence shows that the thicker skin of guinea-pigs may be penetrated by rat leprosy organisms just as readily as that of the rat and mouse, although apparently the former is an unsuitable host. It has been contended that because of degeneracy or death of most of the organisms of superficial lesions, large numbers are required to produce infection. That this type of organism is of low viability is suggested by my inunction experiments with both human and rat leprosy. Nevertheless, these organisms are capable of invading the skin. Organisms of primary ulcers, fæces and urine, on the other hand, appear to have enhanced viability in rat leprosy. Relative viability may be roughly assessed by subcutaneous inoculation of regular numbers of bacilli; the more viable organisms produce larger lesions which appear earlier. Marchoux found organisms from human nodular lesions to be viable and pathogenic after storage for four years in glycerin in the refrigerator; he also considered that temperatures of 37° C. for twelve days or of 60° C. for fifteen minutes destroyed their viability. My own records show destruction of viability of rat organisms in a saline emulsion after half an hour at 58° C. Destruction was also effected by the freezing of a similar emulsion for one week, or the freezing of an infected (dead) rat for the same time. The freezing of these materials for twenty-four to forty-eight hours resulted in a lowered viability of organisms. Desiccated fæcal and urinary rat organisms stored at room

temperature lose viability somewhat slowly; dried fæcal bacilli invade the skin and produce generalized lesions by superinfection after being dry for more than two years. It is generally considered that resistance is broken down by general debility, vitamin deficiency or other predisposing causes, which makes the attack of the lepro bacilli successful. According to my observations, the breaking-down of resistance is accomplished only by the organisms themselves. In the rat experimental superinvasion by inunctions with bacilli on scarified areas proved to be a gradual process. When the breakdown has occurred, there is a significant uniformity in the appearance of true intracellularity; this persists and constitutes the real criterion of infection. Usually intracellularity occurs twelve to fourteen days after the final inunction (first after the breakdown) when the animal has obviously become susceptible to the invasion. Optimum cellular invasions by bacilli suggest a state of true virulence, during which there appear to occur periodic release from packed leucocytes and invasion of fresh cells. These observations place a practical construction on Cook's theoretical expression: "Leprosy results when these phagocytes are incapable of destroying the invading organism, which multiplies in their cytoplasm after ingestion." Similarly, Wade and Rodriquez state that "the presence of globi indicates multiplication of the organisms". Organisms of moderate viability by superinvasion appear to break down local resistance; the rats apparently become lightly susceptible, with the production of moderate superficial intracellularity, which later disappears. In such cases organisms are recovered from glands and some organs at post-mortem examination two to three months later, but none are found in the skin. It has been suggested by Marchoux and myself that in some animals there appears to be evidence of acquired immunity, glandular organisms previously noted having disappeared. In such animals intracellularity was of minor quality or non-existent, resistance is merely lowered locally and there is no indication of general susceptibility; post-mortem findings are completely negative.

Hygiene and Leprosy.

Human leprosy is considered to be more a disease of rural than of urban people. Scott[20] in Basutoland calls it bushman's disease or "*Liefer le Bova*". He notes the large number of leprosy cases among Kimberley miners, whose sanitary arrangements were extremely bad. Innes[7] records a preponderance of agriculturalists among the leprosy patients in India. In view of the high endemicity of the disease in China, it is interesting to note that in a broadcast talk on February 18, 1945, Dr. Tsiang, chairman of UNRRA in 1945, at Lapstone, N.S.W., stated that about 70% of China's population was associated with agriculture.

It appears to be fully appreciated that good hygienic conditions are inimical to the dissemination of leprosy. Tanon and Villaret[23] associate unhygienic conditions, rather than climate, with its spread in French Oceania. Walker and Plantilla tend toward the implication of soil contamination, while in Madeira a vegetable has been incriminated. Lampe refers to the semi-saprophytic behaviour of the virus, and with De Moor actually obtained infection of rats by the agency of mud from an infected rat-run; they obviously did not appreciate the contaminating source. That bad sanitation was considered to be a factor in dissemination in the early days is emphasized by Scott's[20] statement on conditions in Iceland:

> but among the poorer all the people on the farm—men, women and children—might sleep in one room, and they took their meals there. . . . The air consequently was foul and unwholesome; cats, dogs and children would play and lie on the dirty reeking floor, "exchanging caresses and echinococci". In the corner would stand a bucket which received the urine of all the inhabitants and nothing was thrown away, for this was considered good for washing wool.

The daily elimination of very large numbers of organisms in the excreta of man and rat assumes an importance excelled only by the infection of rats by Hansen's organism from excreta and by the more generalized infections of rats by Stefansky's bacillus also from the excreta. These findings add significance to Rogers and Muir's[17] statement on Sweden. In 1871 the attacked were noted to be children, relations or servants, or such persons who frequently visited families residing in houses where the illness had been. It is of considerable interest to note the verbal assurance of Dr. L. A. Musso that leprosy is gaining ground among the aboriginal population of the Kimberley district where the sanitary arrangements are primitive.

From the above considerations rises the necessity for sanitary control of grounds surrounding infected houses; without control the soil may become heavily contaminated with organisms. This is emphasized by the fact that rat organisms dried and stored for about two years at room temperature remain viable and invade the skin without difficulty. Urinary bacilli when dried also remain viable, but have not been given such extended tests. The discharge of patients from leprosaria, apparently cured, and their readmission suggest that conferred immunity is of a temporary character, and raise the question whether such patients are suffering from true relapses or from reinfections due to contaminated soil or their old haunts.

Records of readmissions to leprosaria are many. Cook states: "It is unfortunate, however, that the majority of those discharged from Peel Island are later readmitted in a worse condition than before, and enquiry reveals that in every instance the patient on discharge has repaired to the endemic area whence he originally came." Apparently there was no evidence of fresh cases of leprosy in the areas concerned. Rogers[18] records the following readmission rates: Pretoria, 10%; Southern Rhodesia, 20%; Fiji, 16%. Hopkins and Faget[6] record the discharges from the National Leprosarium, United States, and give the following readmission rates for the different types of disease: tuberculoid, nil; neural, 9%; lepromatous, 12·5%; mixed, 26%. Austin[1] gives figures for Makogai as 660 discharges, 103 readmissions or 15·6%. Of patients discharged from segregation at Nauru over a period of some years, 20 were readmitted; among the discharged clinic patients, readmissions were on a larger scale. Since Dew carried out his work at Nauru, the hygienic conditions have been improved by the introduction of a latrine system, *et cetera*.

Climate and Leprosy.

Leprosy having been endemic in many parts of the world with a variety of climatic conditions, it is consequently hard to appreciate where climate fits into the scheme of dissemination as it is understood at the moment. Mills's suggested influence of a low stimulation index figure could be operative mainly or only in tropical regions. The association of insects with climate and transmission of leprosy is uncertain, and would probably necessitate a great variety of vectors in various parts of the world. Nevertheless, organisms are picked up and transported by many species of insect and actually passed to the skin in the excrement during feeding. The more genarally accepted mode of dissemination appears to be associated with open ulcers, either directly or indirectly, by the agency of clothing or other objects. Although it is inconceivable that climate could play any important part in this connexion, Roger's humidity factor associated with organisms in excreta now assumes considerable importance. In rat-runs, which are usually sheltered, humidity is ever present and urination and defæcation take place mainly in positions where excreted bacilli are protected. Among human beings, excretion occurs under hygienic or non-hygienic conditions, and in varied climates which may be favourable or otherwise to the viability of organisms. Infection and generalized lesions have been produced by excreted organisms in rat leprosy, while infections of light internal character in rats have been effected by organisms excreted by man. Such infections tend to explain the large number of human nodular lesions which occur in wet countries where insanitary conditions prevail. Santra noted neural lesions in the hot dry areas of India, which on transfer of the subjects to a colder, moist climate became lepromatous, and on retransfer of the subjects to the hot dry conditions reverted to the neural type. If this is true, this tendency would emphasize the necessity

of reinfection in bringing about generalized leprosy. Cook, in Australia, had a similar experience in finding anæsthetic lesions of leprosy in the hot dry hinterland, while nodular lesions were a feature of the wet coastal belt. He found nodular lesions in the aborigines of hot, dry areas and considered them as a race susceptible in either kind of climate. It is thought that the factor for infection in these cases was more probably associated with racial or tribal customs rather than with racial susceptibility.

Areas regularly used by lepers passing organisms in their excreta would become highly impregnated, and thus would be potentially dangerous spots. Cook suggested that endemicity was absent because of the ultra-violet radiation in hot dry areas; he also associated curative properties with this radiation. He drew attention also to the presence of this radiation in the parched, treeless inland, contrasting this with its comparative absence from cultivated and forest areas of the wet belt. Temperatures of moist soil are more uniform and lower than those of dry soil, which may fluctuate. There is evidence that dry soil, being a bad conductor, warms up quickly and varies more in temperature. Surface temperatures, because of absorption, are much higher than those in air at a distance from the ground, radiant energy being reflected less from black humus soil than from a chalky surface.

The temperatures under the grass pad and under two inches of wet soil are very similar; they are about 10° or 11° C. below those of dry soil at the same level, the latter being about 9° C. below the temperature of dry soil half an inch under the surface. On an overcast day the minimum surface temperature is about 25° C. below the maximum for sunny days, the average being about 20° C. lower than the maximum for sunny days. Sydney surface temperatures on sunny days would be much lower than in tropical areas. It seems probable that Taylor and Young's[22] solar temperatures would be lower than surface temperatures in the same locality because of surface reflection. The mean temperatures in this series would apparently be lethal to the organisms on eight occasions. Since they are monthly averages, it is obvious that on many more days during the month the temperature would also be lethal.

Marchoux and myself have recorded destruction of viability of the organisms of human and rat leprosy after exposure for a short time to temperatures of 60° and 58° C. respectively. Such high surface temperatures in tropical regions assume considerable importance when they are associated with indiscriminate surface evacuations of infected fæces and with insanitation of dry areas. They provide a factor for the destruction of the organisms.

On the other hand, wet areas with adequate vegetation, incidental lower radiation and more uniform temperatures would provide protection against such destruction. Rogers, in damp endemic tropical areas, records infection rates ranging from 15 to 60 per thousand of the population. He states that the figures were considerably lower under extremely dry tropical conditions. Joseph[3] found hot, humid conditions favourable to dissemination of leprosy, but considered that cold climates or high altitudes associated with low vapour tension were unfavourable. At this point I would redirect attention to the destructive effects of freezing on the viability of leprosy organisms. Tchin[23] found infection more frequent in the warmer season of the hot, moist climate of Kwantung. Some findings suggest that a difference of climate may be associated with a difference in the type of leprosy. Lie in Norway found nodular leprosy predominant in the wet western portion, while neural lesions were a feature of the dry eastern parts. Cook found nodular leprosy amongst the aboriginal population of dry areas. On the other hand, Musso[11], in the Kimberley district of Western Australia, found the different types predominating in two places only 100 miles apart, Munja having the nodular type and Kunmunya the neural type, although climatic conditions were essentially the same.

The study of readmission cases suggests that they may be cases of reinfection by soil contact rather than relapses. If so, reinfection may occur early or late in the patients' parole period and may thus influence the time factor for their return to the leprosaria. Primary segregation and institutional treatment are intimately associated with hygienic control of excreta, which eliminates the possibility of reinfection; but the literature does not indicate that any attempt has been made to observe microscopic control of excreta even in leprosaria. That excreta of certain human leprosy patients do contain the organisms can no longer be doubted, and under uncontrolled conditions soil contamination is therefore an incidental feature. Consequently, as soil contact is potentially dangerous, precautionary measures should be observed; it is thought, therefore, that service personnel before proceeding to endemic areas should be warned against exposure of the skin to contact with soil. Since this method of dissemination is considered to be a much more dangerous possibility than the old idea of contact with ulcers, whether direct or indirect, sanitary organizations should accordingly be instructed to take all the necessary precautionary measures.

Affinity of Human and Rat Leprosy.

As reservoirs of organisms causing many human infections animals play an important part; but such an intermediary in human leprosy is not accepted. Salle considers the organisms of Hansen and Stefansky identical, and I have recently pointed to their similarity in structure, size and quality of skin invasion for rats. Infection of rats with human bacilli has been recorded by Bayon[2], by Nakamura *et alii*,[13] and by Fite and others. Infection of hamsters with human bacilli has been accomplished by Adler and with rat organisms by Balfour-Jones. De Souza-Araujo, finding globi in the fæces and organs of

Table II.

Temperatures.	Author.						
	Russell,[18] England.	Leather,[18] Pusa, India.	McKenzie, Taylor and Burns,[19] Giza, Egypt.	Taylor and Young, North Queensland. (Thirteen Monthly Mean Readings.)		Fielding, Sydney, Australia.	
				Minimum.	Maximum.	Minimum.	Maximum.
Sunny days:							
Air	June, 30° C.	—	—	—	—	24·5° C.	
Surface	—	70° C.	65° C.	—	—	38° C.	53·0° C.
Under half an inch of soil	June, 35° C.	—	—	—	—	45·0°	50·0° C.
Under one to two inches of soil	—	50° C.	56° C.	—	—	36·8° C.	38·9° C.
Under two inches of wet soil	—	—	—	—	—	27·4° C.	27·9° C.
Under pad of buffalo grass	—	—	—	—	—	26·9° C.	30·1° C.
Solar	—	—	—	49° C.	64° C.	—	—
Cloudy days:							
Air	January, 18° C.	—	—	—	—	21·0° C.	
Surface	17·5° C.	—	—	—	—	27·4° C.	28·3° C.

rats, considered that the affinity had been brought closer. Laigret[33] found that rats were insusceptible to human bacilli, but that lepers were susceptible to the rat organisms; these became invasive and produced globi similar to those of Hansen. They could not be passed back to the rat. Marchoux records a peculiar case of leprosy in man which he considered arose from rats; he named the organism *Mycobacterium pulviforme* and produced serial infection in rats with it. North[34] and Cilento and North[35] found leprous rats in localities and houses from which human leprosy had been recorded years previously. They held that there was no connexion between them. Cook considered the association a close one, since he suggested *Xenopsylla cheopis* as an intermediary; he drew attention, however, to the absence of rat leprosy in the Northern Territory, where many human cases had been recorded. Furthermore, he found that aboriginal lepers were not associated with rats.

Although some 11,000 rats were destroyed at Nauru during 1928, no attempt was apparently made to examine them for rat leprosy; since then there has been no collection of rats. An examination for rat leprosy in this endemic area would be of interest.

While subcutaneous and skin-slit inoculations of fæcal-urinary organisms from human and rat sources produced reactions of a similar character, continued inunction of rats with excreta organisms of the Hansen type produced light internal infection. This response corresponds to that obtained with Stefansky organisms associated with hookworm infestation and in other experiments which were finalized earlier. This similarity of response emphasizes the apparent affinity of the organisms and the parallelism of these two diseases. A still closer affinity is suggested by the finding of organisms in the excreta in both types of disease. Should the organisms prove to be identical, rats and mice might well provide extra danger spots in the soil. Light infection of rats, as recorded here, has been obtained by myself with human excreta organisms. However, I obtained generalized rat leprosy by the method of superinvasion with organisms from rat excreta; in the skin intracellular organisms and superficial lesions were found, and at about 200 days from the initial invasion the excreta contained typical bacilli. These results suggest that human leprosy may possibly be disseminated in a similar manner; such an event would emphasize the seriousness of Rogers's admission: "It therefore became necessary to reconsider and modify the age-long compulsory segregation methods in the light of the newer knowledge." The newer information here presented, although incomplete, suggests the necessity for concentration on hygienic and microscopic control of the excreta of patients with advanced and receding leprosy, rather than on simple segregation of all patients.

Summary.

1. Both patients with advanced leprosy and others with receding clinical manifestations pass organisms in the excreta. These organisms are in large numbers, and in the latter type of case constitute a carrier problem, which points to the necessity for laboratory and hygienic control.

2. These human excreta organisms are capable of invading the skin of rats, producing by superinvasion light internal infection. There was also in some rats evidence that partial immunity had developed.

3. Leprous blood, when hæmolysed and inoculated subcutaneously, gives rise to early primary lesions in rats; this suggests its use for the early diagnosis of human leprosy.

4. Climate is considered to be of secondary importance to hygiene in the dissemination of leprosy. Solar radiation in dry areas is probably effective in destroying viability of fæcal organisms evacuated on soil; wet areas and incidental vegetation afford some protection to such organisms.

5. Viability of the organisms appears to be destroyed by heating to 58° or 60° C. for a short time, or by extended freezing; short-period freezing tends to lower the viability.

6. If stored dry at room temperature for periods up to two years, rat excreta organisms remain viable and invasive and produce early lesions on subcutaneous inoculation.

7. The incubation periods calculated from infection to the appearance of lesions appears to depend on high viability of bacilli and on superinvasion, early neural leprosy being probably like glandular leprosy of rats—a product of early invasions of bacilli.

8. Superficial regional lesions are dependent more on superinvasion than on metastasis.

9. Both human beings and rats with leprosy pass in the excreta numerous organisms capable of invading the skin of rats and of producing intracellularity. Increased virulence is associated with intracellularity of organisms. This is suggestive of a closer affinity between the bacillus of Hansen and that of Stefansky.

Acknowledgements.

For permission and encouragement in carrying out this work, thanks are due to Professor Harvey Sutton; to Dr. R. E. Murray I am grateful for advice and for the checking of results and the manuscript, to Dr. C. J. M. Walters and Mr. H. Angel, Prince Henry Hospital, for supply of human material, and to Mr. J. Sutherland for assistance and for care of animals.

References.

For references without numbers I am indebted to the second edition of "Leprosy" by Sir Leonard Rogers and Dr. E. Muir. The others are contained in my rat leprosy paper, *loco citato*.

(1) C. J. Austin: "Report of Central Leper Hospital, Makogai, Fiji, 1944", page one.
(2) H. Bayon: "The Culture and Identification of the Germ of Leprosy and the Relationship of the Human and Rat Leprosy", *Transactions of the Society of Tropical Medicine and Hygiene*, Volume V, 1912, page 158.
(3) R. W. Cilento and E. A. North: "Human and Murine Leprosy in Tropical Australia. Preliminary Notes and Observations", The Medical Journal of Australia, Volume II, 1931, page 767.
(4) H. R. Dew: "Report on Leprosy. Report on Administration of Nauru", 1924, page 28.
(5) J. W. Fielding: "Rat Leprosy. Observations and Transmission", The Medical Journal of Australia, Volume I, 1945, page 473.
(6) R. Hopkins and G. H. Faget: "Recent Trends of Leprosy in the United States", *The Journal of the American Medical Association*, Volume CXXVI, 1944, page 937.
(7) J. R. Innes: "Occupation and Leprosy", The Medical Journal of Australia, Volume I, 1936, page 815; "A Leprosy Survey in the Island of Malaita, British Solomon Islands", *International Journal of Leprosy*, Volume VI, 1938, page 501.
(8) J. Joseph: "Factors Influencing the Incidence of Leprosy in Madras Presidency", *Leprosy in India*, Volume XI, 1939, page 3.
(9) L. Lagane: *"Bacillure provoquée dans la lèpre"*, *Bulletin de la Société de pathologie exotique*, Volume V, 1912, page 784.
(10) J. Laigret: *"Sensibilité de l'homme lépreux au bacille de la lèpre murine"*, *Archives de l'Institut Pasteur de Tunis*, Volume XXI, 1932, page 290.
(11) L. A. Musso: "Final Report of a Leprosy Survey of the Kimberley Division of Western Australia", Commonwealth of Australia, National Health and Medical Research Council, 1941, page 33.
(12) K. Nakamura, S. Kobashi and J. Matsumoto: "Inoculation of House Rats with Human Leprosy", *Japanese Journal of Experimental Medicine*, Volume XIII, 1935, page 619; cited in *International Journal of Leprosy*, Volume V, 1937, page 391.
(13) M. Nanba: *"Eine neue Nachweismethode der Leprabazillen in Strömenden Blut"*, *The Japanese Journal of Dermatology and Urology*, Volume XLIV, 1938, page 192; cited in *International Journal of Leprosy*, Volume VIII, 1940, page 135.
(14) E. A. North: "Investigation in Rockhampton into Possible Relationship between Human and Rat Leprosy", *Health*, Volume VIII, 1930, page 67.
(15) R. Radna: *"Sur la bacillurie des lépreux"*, *Annales de la Société belge de médecine tropicale*, Volume XIX, 1939, page 51; cited in *International Journal of Leprosy*, Volume VIII, 1940, page 548.
(16) L. Rogers: "Progress in the Control of Leprosy in the British Empire", *International Journal of Leprosy*, Volume X, 1942, page 87.
(17) L. Rogers and E. Muir: "Leprosy", Second Edition, 1940, page 154.
(18) E. J. Russell: "Soil Conditions and Plant Growth", Seventh Edition, 1937, page 504.
(19) M. Sardjito and J. B. Sitanala: "The Demonstration of Lepra Bacilli in the Blood by Means of the Thick Drop Method", *Mededeelingen van den dienst der volksgezondheid in Nederlansch-Indië*, Volume XXI, 1932, page 32.
(20) H. H. Scott: "A History of Tropical Medicine", Second Edition, 1942, pages 582 and 585.

(21) L. Tanon and B. Villaret: *"Le climat et les maladies en Océanie française", Hygiène et médecine*, May, 1939; cited in *International Journal of Leprosy*, Volume VIII, 1940, page 531.
(22) F. H. Taylor and W. J. Young: "The Coastal Climate of Tropical Queensland", *The Journal of Tropical Medicine and Hygiene*, Volume XVII, 1914, page 225.
(23) D. Tchin: *Ueber die Lepra in Kwantung", The Japanese Journal of Dermatology and Urology*, Volume XLVI, 1939, page 41; cited in *International Journal of Leprosy*, Volume VIII, 1940, page 531.
(24) Ashburton Thompson: Prize Essay on Leprosy, New Sydenham Society, 1897.

THE BOTANY OF TOOWOOMBA AND ENVIRONS AND ITS RELATION TO CLINICAL ALLERGY OF THE UPPER RESPIRATORY TRACT.[1]

By CHARLES R. MORTON,
Toowoomba.

For the past nine years I have been pursuing a systematic investigation of the flora of Toowoomba and environs in order to determine the common offending allergens, and the effect of the seasonal and meteorological variation of the pollen content of the atmosphere on the clinical incidence and character of hay fever and asthma in this district. This investigation has taken the following usual form: (i) the carrying out of field botanical surveys combined with atmospheric pollen studies to determine the potential air-borne allergens; (ii) recording of the variation of local flora and atmospheric pollen content with seasonal and meteorological conditions; (iii) the clinical and laboratory investigation of patients suffering from seasonal allergy of hay fever and asthma type. I cannot, within the scope of this paper, discuss the methods of agrostological surveys or atmospheric pollen studies, but I shall present the results of these investigations as carried out by myself in this district. Unfortunately, the break that occurred whilst I was away with the Australian Imperial Force interrupted the continuity of the statistical side of my investigations. The clinical incidence and local character of air-borne allergy of the hay fever and asthma type will be the subject of a later and detailed communication.

Botanical Considerations in Seasonal Allergic Manifestations of the Hay Fever and Asthma Type.

Atmospheric Pollen Studies.

Without constant observation of pollen plates and a knowledge of the local pollination peculiarities they uncover, investigation and treatment of patients with upper respiratory tract allergy cannot be satisfactorily performed. I can only reiterate the conclusions of I. S. Kahn, of San Antonio, Texas:

> The value of atmospheric pollen plates cannot be overestimated. If daily examinations are made of the pollen content of the air during seasonal immunization treatments, not only will local causes of hay fever be uncovered that would otherwise have passed unnoticed, but also many periods of freedom from symptoms during the treatment will be found to be due to relative freedom of the air from pollen, owing to atmospheric conditions; and certain reactions ascribed to treatment will be found to be due to unsuspected pollen presence.

Pollination.

Wind pollination (anemophily) was the most primitive method of pollination, and most of our primitive flowering plants are wind pollinated. Insect pollination (entomophily) probably arose when at some early period insects developed the habit of feeding on pollen. This method of pollination proved economical so far as production of pollen necessary for fertilization was concerned. It had, however, certain disadvantages, in that a plant became limited to the habitat of its insect pollen vector. Return to wind pollination became necessary, therefore, in the case of many plants, and in spite of the extravagance of this method of pollen dispersal, the anemophilous plants have managed to flourish over wide areas. This would not have been possible with the limitations imposed by entomophily.

It is a curious biological fact it is those members of the plant kingdom which have abandoned insect pollination and have returned to their former anemophilous habits, that are responsible for most of the seasonal allergic manifestations. Certain plants that have not become perfectly adapted to insect pollination are also a potential menace to seasonal sufferers from hay fever and asthma, and this is to some extent a measure of the imperfection of their adaptation to entomophily—for example, the willow. Again, certain plants which disseminate large quantities of pollen into the air are known to be relatively rare causes of seasonal hay fever and asthma. Their pollen does not contain a specific exciting substance—for example, the pines.

The entomophilous plants, which rely on insects to transport their pollen, have as a rule large sticky pollen grains which clump together easily. This is due to their heavy impregnation with lipoid substances, and it effectively prevents them from being carried far in the air. They cannot, therefore, be counted amongst the serious causes of seasonal hay fever and asthma, although some entomophilous plants occasionally cause symptoms on close contact by the hypersensitive patient. The entomophilous plants have bright, colourful flowers and readily attract one's attention. A patient is naturally prone to attribute his symptoms to the conspicuous members of the plant kingdom in his immediate environment, rather than to their less gaudy cohabitants, the grasses and weeds. Most of the double roses in cultivation are of hybrid origin and produce little or no pollen, so it is only from the wild varieties and from some of the single flowering cultivated varieties that any appreciable amount of pollen can be obtained. Wattles are insect pollinated, and very little of the pollen from these trees enters the air. The foregoing facts can be easily verified by the exhibition of atmospheric pollen plates in proximity to the suspected entomophilous plant.

The anemophilous plants, which rely on the atmosphere for the dissemination of their pollen, produce large amounts of light, buoyant pollen, which may be carried long distances by the wind. They are the most common offenders in seasonal allergy of the hay fever and asthma type. Much misconception is abroad, and the confusion that exists has helped to keep alive the old superstition of wattle and rose allergy.

Morphology of Anemophilous Pollen.

Pollen grains range in size from 4μ to 200μ. However, it is only the grains of intermediate size that are good floaters—for example, those from 17μ to 58μ. The larger grains are a little beyond the gravitational range of easy floating, but stick well. In the lower range the small size of the grains is a hindrance to their leaving the pollen anthers, and only when the plant has developed an efficient ejecting mechanism does it disseminate its pollen by air. Pollen grains of plants belonging to the same family possess basic phylogenic characters common to the group. Environmental conditions may profoundly alter this basic structure. Particularly is this so with the environmental factor of anemophily; it may so alter the basic structure of pollen grains of a plant that its pollen grains are with great difficulty identified with those of the entomophilous members of the same family. The modification of the structure of a pollen grain in response to anemophily is mainly reflected in the external features of the grain. The exine is thin, the surface shows reduced or very little ornament of any kind; there are no conspicuous spines. Furrows are small and rudimentary. Because of the thinning of the exine, furrows are no longer necessary for volume-space accommodation that occurs with altering atmospheric conditions. They may become so reduced that they coincide with the enclosed germ pore. We may, therefore, have members of the same family sharply divided into the following two groups by their pollen grain characters: (i) those which are echinate-grained and insect-pollinated; (ii) those which are smooth-grained and wind-pollinated.

[1] Read at a clinical meeting of eye, ear, nose and throat medical officers of a base section, Medical Corps, Army of the United States.

To generalize, therefore, pollen that may give rise to allergic reactions of the seasonal hay fever and asthma type possesses the following characteristics: (i) it is anemophilous, relying on the wind for dissemination; being light and buoyant, it can be carried a considerable distance by the wind; (ii) it is fairly prolific in its production; large quantities of pollen enter the air over a relatively long period of time; (iii) it contains a specific exciting substance capable of producing symptoms in hypersensitive patients.

Pollination in Tropical and Subtropical Climates.

In Australia climatic conditions profoundly alter the pollinating time of plants. This is noticeably so in tropical and subtropical regions, where there may be little difference in temperature between summer and winter. Here the most important factor concerned in pollination is rain. Rapid growth, blooming and seeding of plants take place after any sufficiently heavy rain, often independently of the time of the year. The pollinating time of these plants is, therefore, given in terms of season rather than of month. In the far north of Australia there are only two seasons, "the wet" and "the dry". With the onset of "the wet", with its heavy tropical rains and high humidity, the rate of growth of flora is truly prolific. During the dry spell that succeeds the late summer "knock 'em down" rains there is little growth or pollination.

Allergic Skin Manifestations.

As a rule this type of reaction is of an eczematous nature and is not to be confused with the hay fever asthma type of allergic reaction. It may occur in patients from exposure to entomophilous pollen, and also rarely from exposure to anemophilous pollen. It is due to the oily substances on the exine of the pollen grains, and not to the specific exciting substance that occurs as an integral part of the chemistry of the pollen grain in hay fever and asthma allergy.

In this type of allergic reaction, the immunological processes involved are a little different. The causative factor is discoverable by patch test, or by reproduction of the lesion at will upon contact with the allergen. It is not demonstrable by the immediate urticarial weal reaction of the intradermal or scratch test.

Topography and Meteorology of Toowoomba and Darling Downs, Queensland.

The city of Toowoomba is situated on the edge of the Great Dividing Range at a height of about 2,300 feet above sea level. To the east there is an abrupt drop of about 1,500 feet to fertile valley lands given over to mixed farming and some citrus orchards, which rely on irrigation from neighbouring creeks for their water. Grasses and weeds grow profusely, and examination of pollen slides taken in summer, during easterly winds, reveals heavy atmospheric grass pollinosis. To the west there is a gradual slope to undulating plains, where dairy farming and mixed farming are the rule. Toowoomba is on the northern fringe of the rich cereal-growing district of the Darling Downs. To the west are large sheep-grazing areas and farther west cattle-grazing areas.

The city area itself consists of a central business area with surrounding residential regions. Farther out of town, at a radius of about three miles, are numerous small mixed farms. Within the city area are many parks, well provided with fine trees—pines, cedars, camphor-laurels and eucalypts. The streets are also well treed, and each footpath has its grass plot. The grasses grow profusely in the parks, sidewalks and surrounding paddocks. Normally, the flowering of grasses and weeds is kept at a minimum in the central areas, the parks and sidewalks being well mown. This year (1945), however, with the shortage of manpower and heavy rains, there has been profuse flowering of grasses in the heart of the residential area. An old, dried-up swamp area runs north-west and south-east along the eastern fringe of the business area. This has many fine weeping willows, and after rain has a profuse growth of paspalum. It will be seen, therfore, that there is a large potential source of wind-borne pollen in and encircling Toowoomba. Tree pollen production is confined practically to the city itself.

During my ten years' residence and practice in this district I have seen a pronounced variation in the climatic conditions from year to year; there is, however, a fairly typical annual sequence. Winter, from May to August, is as a rule very dry with little or no rains. Nights and mornings are very cold, and the middle of the day is warm. In the middle of winter a few severe frosts occur. There is then little or no growth; paddocks are covered with bare stalks waving in the wind. Periods of bitter westerly winds occur and last from three to five days. Spring commences from the middle of August to early September, with warmer mornings and nights and a little rainfall. Tree pollination commences and lasts for a few weeks. The wattles bloom early, some even at the end of June, but as a rule not until July or August. With the onset of warmth and rain, the grasses and some weeds show growth, and they generally begin to pollinate early in August. The early summer, up to December, is characterized by hot days and cooler nights, with variable sporadic rains. With the new year comes "the wet", with numerous evening electric storms; humidity increases, and heavy mists on the edge of the range are common. The prevailing winds of summer are easterly and south-easterly, and the condition of hay fever and asthma sufferers is characteristically worse during these winds. As a rule good rains occur well into March, when the paddocks begin to brown off and autumn soon gives way to winter. Some years are characterized by droughty conditions, with a dry winter and very little rain in summer. Grass and weed growth is at a minimum, and atmospheric pollen counts are light. Occasionally there will be a prolonged "wet" throughout spring and summer, and profuse pollinosis will produce a heavy atmospheric pollen count.

The effect of this variation is well reflected in the number of patients who seek relief from seasonal hay fever and asthma from year to year. In the drier years very few present themselves, whilst in the years with prolonged rains numbers of these patients are seen. Sufferers from seasonal hay fever and asthma do well in this district during the drier years. As a result of this, and because of the altitude and mountain climate, this district has become the Mecca of many who suffer from seasonal allergy. This state of bliss lasts only until the onset of a wet summer, when the patient usually returns to his former domicile a disappointed person.

An interesting fact that I have particularly noticed is that during these wet years the typical perennial type of allergic rhinitis seems to be much aggravated. Skin tests reveal no hypersensitivity to the local air-borne allergens. I may have overlooked the offending allergen, but I suspect that there is probably a seasonal variation in the composition of common dust. I had started to investigate the fungous and mould content of the atmosphere of this district and its variations, but pressure of routine work has curtailed the task.

Gramineæ.

The grasses are all wind-pollinated, and as a rule shed enormous amounts of light pollen, which is the cause of much seasonal hay fever and asthma. They are believed to have derived from some insect-pollinated ancestor. The pollen grains are remarkably uniform throughout the species, and in the moist expanded state are oval or spheroidal. They vary in size from 22μ to a little over 100μ. The most characteristic feature of the pollen grain is its single germ pore. Generic differentiation of the grains of the grasses is difficult, and field survey is needed to identify the grasses responsible for the atmospheric pollen.

The grains of the cereals are some of the largest of this group, and are not generally found on atmospheric plates, except when the plate is exhibited in close proximity to the cropped area and during heavy winds. They are self-pollinators, and the heavy grained cereals do not cross-pollinate much. It is, therefore, only the lighter grained cereals that can disseminate their atmospheric pollen very far.

The area of south-west Queensland has large areas given over to open grazing; many areas, especially near the smaller townships, are cultivated and grass crops are grown for fodder purposes. The roadsides are also heavily grassed. One may get an idea of the prolific and widely distributed growth of the grasses when one considers the menace that grass fires become at the end of a wet summer when the "dry" sets in. In fact, a wet summer may become a two-edged sword to the farmer.

The grasses may be roughly grouped as follows:

Early Flowering.—Bromus unioloides (prairie grass), *Dichelachne crinita* (long-haired plume grass), *Lolium perenne* (perennial rye grass).

Intermediate Flowering.—Sporobolus indicus (rat's tail grass), *Andropogon pertusus* (pitted blue grass), *Paspalum dilatum* (paspalum), *Pennisetum villosum* (feather grass), *Eragrostis leptostachya* (love grass), *Digitaria marginata* (summer grass), *Chloris gayana* (Rhodes grass), *Microlæna stipoides* (meadow rice grass).

All these are extremely abundant; meadow rice grass is particularly found in shady places beneath trees and alongside fences.

The following are not so widely distributed, and often occur as weeds in the household garden:

Intermediate Flowering.—Eleusine indica (crowsfoot grass), *Setaria glauca* (pigeon grass), *Setaria viridia, Aristida glumaris, Danthonia semiannularis, Stipa verticillata.*

Late Flowering.—Pennisetum villosum (feather grass), *Chloris gayana* (Rhodes grass), *Tricholæna teneriffe* (red Natal grass).

This last will be familiar to you all as a decorative grass seen growing along the roadside and in paddocks, its pale red heads waving in the breeze.

In a normal summer season with an average rainfall, the early flowering grasses will flourish and pollinate right throughout the summer. However, they are not so profuse as in the earlier part of the season. In a good wet and warm season the later grasses will start to flower with the midsummer group, gradually becoming more profuse. Therefore, in a good season nearly all the grasses will be pollinating at the same time—some, of course, more than others. This is in accordance with the fact that I mentioned above in regard to pollination in warm climates.

These observations are reflected in the incidence of clinical allergy from wind-borne pollens. If there is a dry spring with late rains, the hay fever season is short. In a year such as we have just experienced, with almost continuous rains throughout spring and summer, the duration of the hay fever season is prolonged. In summer and spring the prevailing easterly winds produce a heavy atmospheric content of grass pollen. The immediate effect of rain is lowering of the atmospheric pollen content; but it is increased again when the cleansing effect of the rain has been offset by the pollinosis which follows it. The heavy evening mists that occur in summer, on the range in Toowoomba also have a cleaning effect on the air.

The Weeds.

Investigation of the role played by common weeds as a cause of hay fever and asthma is a formidable problem. Although the weeds of Queensland are legion, atmospheric pollen studies reveal that anemophilous weed pollen, commonly detected on pollen plates, belongs to a few well-defined groups. A field survey will soon identify the particular member of the family or tribe growing locally.

The Plantagineæ—plantain family (*Plantago major, Plantago varia, Plantago lanceolata*—common rib grass) are widely spread weeds of farm, pasture and garden. They are all wind-pollinated. *Plantago lanceolata* occurs early in spring with the first rain and warmth, and is most prolific in the first months of spring when examination of pollen slides reveals heavy plantain pollination. However, plantain pollen is found on slides throughout the whole of summer, the quantity depending on the prevailing weather. Differentiation of the pollen grains of the members of this family is fairly easy. It is found that *Plantago lanceolata* is the most profuse producer of pollen. The grains are spheroidal and from 16μ to 40μ in diameter; furrows are absent. The germ pores are circular or irregular in outline, not elongated, scattered and number four to fourteen. The pore membranes are flecked, or have a single central thickening; the exine is thin, without conspicuous thickenings. The presence of thin exine and pore-like furrows suggests that these grains are reduced in form in response to anemophily. The members of this family are found to be common offenders in seasonal hay fever and asthma.

The Polygonaceæ—dock and sorrel—are a large group of weeds widely distributed, only some of which are wind-pollinated. These weeds appear a little later than the plantains, as a rule awaiting the warmer summer months. They do not, from investigation, seem to be so potent as the grasses and other weeds in the production of seasonal hay fever and asthma. The following are the common anemophilous members occurring locally: *Rumex crispus* (curly dock), *Rumex acetosella* (sheep sorrel). The pollen of the anemophilous members of this family possesses all the physical characters of hay-fever-producing pollen, and is found in appreciable amounts on atmospheric plates throughout summer. The grains of anemophilous members of this family show fairly uniform structure; grains of entomophilous members are variable in structure. The pollen grains of rumex when moist are ellipsoidal or spheroidal, measuring 23μ to 32μ; the furrows are long, slender and pointed at the ends, and number three to five. The furrow membrane is smooth. The exine is distinctly pitted, and the grains are packed with starch. The germ pore is elliptical in shape; the long axis is directed in the same sense as the furrows.

The next families are the Chenopodiaceæ (goose-foot family) and the Amaranthaceæ (amaranth family). All the weeds belonging to these two families are widely distributed on farm and pastures and are common garden weeds. All are wind-pollinated and shed abundant light pollen. Of the Chenopodiaceæ, *Chenopodium auricomum* (blue bush), *Chenopodium atriplicumum* (lamb's quarters) and *Chenopodium nitraricea* (nitre bush) are liked by sheep and cattle; *Chenopodium triangulare*, a salt-bush, is most common in Queensland. Kochia are salt-bushes known as "cotton bush" and "grey bush". Atriplex is widely distributed; it is and excellent forage plant and remarkable for its drought-resisting qualities. The Australian salt-bush, *Atriplex semibaccata*, according to Wodehouse, has been extensively cultivated in America, and is regarded as an important cause of hay fever in California. Other related weeds are Salsola (Russian thistle), *Anisacantha muricata*, commonly called "roly-poly weed", and *Amaranthus spinosum, Amaranthus paniculatus, Amaranthus interruptus* and *Amaranthus viridis*. The four last-mentioned are common and troublesome weeds of garden and field. They grow from one to three feet high.

Alteranthera echinata, "khaki weed", is a plant introduced from South America; it has a sharp flowering spike, and rapidly spreads if allowed to grow unchecked.

Pollen grains of Chenopodiaceæ are indistinguishable from the closely related family Amaranthaceæ; they are uniform throughout all members. The size is 25μ to 35μ, and germ pores number from 14 upwards; they are generally circular in outline, and flecked with granules. Their distribution over the surface is not isometric. The exine is thin and granular, and unadorned except for the germ pores. It is thought that the Chenopodiaceæ are derived from some entomophilous ancestor, the exine of whose pollen grains was heavily sculptured and demobilized, so that an increase in the number of furrows was essential to accommodate the volume change. With the reduction in response to anemophily, the large number of furrows has remained.

The members of these two families flourish throughout the later summer months, and are resistant to drought, especially the salt-bushes. These weeds are some of the worst hay fever offenders in late summer months.

Compositæ. In southern States, capeweed, originally imported from South Africa, has been listed as a frequent cause of seasonal hay fever and asthma, because of the frequency with which positive skin reactions

to extracts of this pollen occur during skin testing. This weed does not, to my knowledge, grow in this State. I have found many patients, however, yielding positive skin reactions to extracts of this pollen. This is probably due to the biological relationship that exists between the pollen of this plant and that of other members of the same order.

The order Compositæ is by far the largest of all natural orders. Of flowering plants, we have sunflowers, cornflowers, marigolds, calendulas, zinnias, dahlias, cosmos, calliopsis, gaillardia, chrysanthemums, senecio, daisy and many others. Many of our common weeds are also members of this order: *Cnicus lanceolatus* (common thistle), *Silybum marianum* (St. Mary's thistle), *Bidens pilosa* (cobbler's pegs), *Tagetes glandulosa* (stinking roger), and *Erigeron linifolis* and *Erigeron cadensis* (fleabane)—the last-mentioned three grow very tall—*Ageratum conyzoides* (billy-goat weed), *Hypocharis radicata* (native dandelion), *Baccharis halimifolia* (tree groundsel), *Taraxicum officinale*, *Latuca cleraceus* (sow or milk thistle), and *Latuca scariola* (prickly lettuce).

The daisy family also includes most of the thistles. There are also many small growing composite weeds; most of these are entomophilous, their pollen grains are beautifully sculptured and with few exception their pollen is not found on atmospheric plates.

The entomophilous members of this order Compositæ are confined almost exclusively to Anthimideæ, the mayweed tribe, and Ambrosiæ, the ragweed tribe. The Anthimideæ tribe is divided rather sharply into two groups: (i) the entomophilous members with echinate pollen; (ii) the anemophilous members with smooth-grained pollen. The genetic gap between the two groups is wide, no intermediate forms occurring. The only common members occurring in these areas are: *Anthemis cotula*; *Cotula anthemifolia*, "jo jo weed"; *Cotula australis*; *Centipeda orbicularis*; *Soliva anthemifolia*.

All the members of the Ambrosiæ tribe are anemophilous: *Ambrosia tenifolia*; *Xanthium spinosum* "Bathurst burr"; *Xanthium strumarium*, "Noogoora burr". A characteristic of the pollen grains of the anemophilous members of the Compositæ is reduction in the size of the spines and thinning of the exine in response to wind pollination.

I have found cutaneous hypersensitivity to weed pollen alone very uncommon. As a rule, patients with seasonal allergic symptoms, who show cutaneous hypersensitivity to weed pollen, also exhibit cutaneous hypersensitivity to various grass pollens. There appears to be no counterpart in this region of Queensland of the late summer hay fever of North America, due to pollen of Anthimideæ and Ambrosiæ.

For the first time this year, I have encountered a number of late summer cases of hay fever. In atmospheric pollen plates only mild grass and weed pollination was observed. A field survey revealed dry, browned country, a few members of the Chenopodiaceæ, Amaranthaceæ and Polygonaceæ occurring in cultivated areas. The only grass flowering was *Tricolena teneriffe*, which was fairly profuse in scattered areas. I shall watch carefully for these cases in subsequent years.

The Trees.

Most of the anemophilous trees shed enormous amounts of buoyant pollen into the air, but few possess any capacity to produce hay fever or asthma. This is partly on account of their limited distribution and their relatively short pollinating season, and also because their pollen does not seem to be a potent allergen-producing material. This may be because of its ancient phylogenetic origin, as mentioned earlier.

Very little is known of the pollen morphology and local pollination characteristics of our native trees, and much of my investigation in this direction has been most difficult. I shall deal with the trees as they are found here; firstly, those that appear in cultivated areas, the streets, gardens and parks of this city. This description will also apply fairly well to other towns in Queensland of same climate.

Toowoomba is well supplied with many fine trees, in park areas and private homes, and along the roadsides. Here we find the common decorative and shade trees, the pines, junipers, cypresses, planes and elms. These are all wind-pollinated, and their pollen is found for a short period on pollen plates in August, September and October; duration of pollination depends greatly on the weather. Pollen of these trees is found in great quantities on atmospheric pollen plates exposed in relatively close proximity to park areas.

In the heart of Toowoomba there are a great number of weeping willows, along what were originally creek beds. The weeping willow tree belongs to the family Salicaceæ; other members of the same family are the poplars. The poplars are wind-pollinated, but the willows are insect-pollinated. Their adaptation to insect pollination, however, seems to be imperfect, as they are capable of disseminating appreciable amounts of pollen into the air, as detected on atmospheric pollen plates. They do not appear to be potent offenders, and I have not as yet encountered any cases of hay fever or asthma that I could attribute to this source. The following are other common trees: The camphor-laurel (*Cinnamomum camphora*), of the family Lauraceæ, is a native of China and Japan; the flowers are hermaphrodite, and it is not wind-pollinated. The white cedar (*Melia dubia*) and the red cedar (*Cedrela toona*) are natives of Australia, and not true cedars. They belong to the family Meliaceæ, to which also belong some of our native trees yielding good commercial woods. The jacaranda, of the family Bignoniaceæ, is a beautiful decorative tree with purple flowers; it is insect pollinated. The pepperina (*Schinus molle*) belongs to the family Anacardiaceæ. It is insect-pollinated and has large, sticky pollen. It is said to be the cause of a great deal of hay fever during the months of November and December in South Africa. I have found no hypersensitivity to this pollen by intradermal skin tests. This tree is a member of the family that contains the famous poison oak of America. It may be a possible culprit in cases of contact dermatitis here, and it is a common inhabitant of small country towns on the Darling Downs. In my future investigations, the first-mentioned trees, being wind-pollinated, will be under greater suspicion than the last-mentioned trees, which are insect-pollinated.

Secondly, I shall deal with trees that occur in the open areas away from the city. Native trees are characteristically gregarious. Particular species are often found growing thickly together in circumscribed areas. The eucalypts (family Myrtaceæ) probably form three-quarters of the vegetation of this continent. They include the so-called teatrees, bottle-brushes *et cetera*. However, the number of species, more than 300, is not appreciably large for such a wide geographic range. Some specimens are tall and of enormous height, others are small, dwarfed shrubs known as mallees. Their pollen is rarely found on atmospheric slides. The grains have triangular surfaces and very thick exine and are colourless throughout. Many of these are excellent bee trees, and honey from their district is much sought after. They are often self-pollinating, and cross pollination under natural conditions in the eucalypts is exceptional. Numerous species are found growing intermixed, often flowering at the same time, and so under supposedly favourable conditions for hybridization; yet with marked constancy they preserve throughout extensive areas their specific characters. I do not, therefore, expect them to be a factor in local pollen allergy.

Acacia (family Leguminosæ, the wattles) is a genus of 400 odd small trees and shrubs widely distributed throughout Australia. It is our national flower. Wattles occur gregariously (for example, Brigalow scrub country). They are also popular decorative trees for the home garden and park. They bloom early in spring, and in tropical and subtropical regions may even commence to flower during winter months. The flowers are entomophilous, and the wattles are frequently blamed for early spring hay fever and asthma. However, little of their pollen enters the air, and it is found in small amounts on pollen plates only when they are exhibited in proximity to the trees and

during heavy winds. Wattles, as has been mentioned above, are also common decorative trees in city areas.

The conifers are native pines which grow in particular areas—the Bunya pines, hoop pines, and cypress pines. However, their distribution is fairly localized to definite scattered areas, and they cannot be any but a local element in pollen allergy, if they play any part at all.

The casuarinas or sheoaks are not true oaks. They are wind-pollinated, and also occur only in defined areas—for example, water oaks, forest oaks *et cetera*. They cannot be a great factor in air-borne pollen allergy.

Tree pollen allergy is, therefore, in Australia as in other countries, of short duration, and exceptionally local in its character and distribution. On future investigation none of our native trees should prove to be a great factor in seasonal hay fever and asthma.

Summary.

1. The various botanical factors concerned in the investigation of seasonal hay fever and asthma are briefly recorded.

2. A short description of Toowoomba, Darling Downs, Queensland, is given from topographical and meteorological aspects.

3. The potential hay fever flora of the above-mentioned district is examined.

4. The following observations have emerged from correlation of technical investigations with clinical findings: (*a*) The most common cause of seasonal allergy of hay fever and asthma type in this district is anemophilous pollen of weeds and grasses. (*b*) Hypersensitivity of patients to pollen of weeds alone is not usual, but is generally associated with hypersensitivity to pollen of grasses. (*c*) Hypersensitivity of patients to tree pollen apparently plays only a minor role in seasonal allergic conditions in this locality. (*d*) There is no true differentiation of seasonal allergy into early, middle and late summer types. (*e*) The onset, severity and duration of the hay fever and asthma season due to air-borne pollen are intimately bound up with the meteorological conditions prevailing, and vary from year to year.

Conclusion.

I have had great difficulty in trying to condense such a vast and interesting subject into such a short space, without making this paper a mere jumble of botanical names. The botanical investigations, both field and air pollen studies, have been carried out in what time I could find in the midst of a busy specialist practice. Apart from the help that I have gained from the recognized publications on this subject, which are duly acknowledged in the bibliography, this work has been accomplished with little expert assistance.

Acknowledgements.

I must pay a tribute to the personnel of the Botanic Museum and Herbarium, Brisbane, for their unstinted cooperation in the identification of plant specimens for me. Personal communications from E. W. Bick, who has since retired from the above-mentioned institution, and from W. D. Francis, have been most helpful.

Bibliography.

J. T. Audas: "Native Trees of Australia", 1942.

F. M. Bailey: "Comprehensive Catalogue of Queensland Plants", 1909; "The Queensland Flora", 1902, Volumes I to VI; "The Weeds and Suspected Poisonous Plants of Queensland", 1906.

R. T. Baker and H. G. Smith: "A Research on the Pines of Australia", 1910; and "Eucalypts and their Essential Oils", 1920.

E. W. Bick: Personal communication.

E. Coleman: "The Australian Wattles", 1943.

R. A. Cooke: "A Consideration of some Allergy Problems. (I) Allergic Dermatitis. (II) Serological Studies of the Skin Reacting Allergies, Hayfever Type", *The Journal of Allergy*, May, 1944, page 203.

G. Erdtman: "An Introduction to Pollen Analysis", 1943.

W. D. Francis: Personal communication.

N. Gutteridge: Personal communication.

K. K. Koessler and O. C. Durham: "System for an Extensive Pollen Survey", *The Journal of the American Medical Association*, Volume LXXXVI, 1926, page 1205.

R. W. Lamson *et alii*: "Potential Pollinosis in a Desert and a Coastal City", *The Journal of Allergy*, January, 1944, page 21.

J. H. Maiden: "The Weeds of New South Wales", 1920.

M. E. Phillips: "Studies in Atmospheric Pollen", The Medical Journal of Australia, August 23, 1941, page 189.

M. M. Sharwood: "The Pollen Content of the Melbourne Air During the Hay Fever Season of August, 1933-March, 1934", The Medical Journal of Australia, March 16, 1935, page 326; "Further Studies on the Pollen Content of the Melbourne Air", *ibidem*, January 23, 1937, page 117.

L. Tuft: "Critical Evaluation of Skin Tests in Allergy Diagnosis", *The Journal of Allergy*, July, 1943, page 335.

F. Turner: "Australian Grasses", 1898; "Australian Grasses and Pasture Plants", 1921.

C. L. White: "An Elementary Text-Book of Australian Forest Botany", 1922, Volumes I to XI.

R. P. Wodehouse: "Pollen Grains. Their Structure, Identification and Significance in Science and Medicine", 1935.

Reports of Cases.

SUDDEN DEATH FOLLOWING INITIAL INJECTION OF A MERCURIAL DIURETIC.

By Alex Murphy, F.R.A.C.P.,
Brisbane.

For many years mercurial diuretics have proved of inestimable value in the dispersal of œdema due to cardiac failure and certain forms of renal disease. It has been recognized that they are capable of producing toxic effects, and that their use is not entirely without hazard; a number of fatalities have been reported, all following administration by the intravenous route. However, it would appear that only three of such fatalities have been recorded as the outcome of the first dose, and it is the purpose of this communication to place a fourth on record.

Clinical Record.

R.K., a female patient, aged twenty-seven years, was admitted to hospital on March 27, 1945. She had suffered from measles in 1943. The present illness commenced seven weeks prior to her admission to hospital, with epigastric discomfort progressing to mild pain and accompanied by vomiting. Transient diarrhœa appeared. The left leg became swollen, the right leg rapidly followed suit, generalized œdema developed, and the urine was noted to be scanty. This condition had persisted up to the time of her admission to hospital.

Examination showed the patient to be a pale young woman with generalized anasarca. The retinal arteries were narrowed. Bilateral hydrothorax was present and the heart rhythm was regular and "tic-tac" in character. The systolic blood pressure was 115 millimetres of mercury and the diastolic pressure 100. The urine on being boiled was solid with albumin; it contained many white and red blood cells, and numerous hyaline, granular and epithelial casts. Culture of the urine yielded a growth of Gram-negative bacilli. The urinary output for the following three days was nine, 15 and 11 ounces respectively.

A blood examination showed that the red blood corpuscles numbered 6,400,000 per cubic millimetre and the hæmoglobin value was 125%; the white blood corpuscles numbered 16,000 per cubic millimetre, 75% being neutrophile cells and 25% lymphocytes. The blood urea content was 21 milligrammes per 100 millimetres, the blood cholesterol content was 333 milligrammes per 100 millilitres and the plasma protein content was 3·45 grammes per 100 millilitres (albumin, 0·75 gramme; globulin, 2·7 gramme).

On March 30, 1,000 millilitres of plasma at half normal dilution were given by the intravenous drip method. The temperature rose to 101·4° F. before completion of the injection, and remained slightly elevated for forty-eight hours. The urinary output increased to 45 ounces and 32 ounces on succeeding days, but fell to 10 ounces on the third day.

On April 4 it was decided to employ a mercurial diuretic, and two millilitres of "Neptal" diluted with five millilitres of distilled water were slowly injected intravenously. The following description of subsequent events has been furnished by the house physician who gave the injection.

Half a minute later the patient shuddered and sighed, the eyes turned upwards, the face became pallid, there was generalized stiffening of the muscles, the tongue was protruded and breathing became stertorous. At this stage 10 minims of adrenalin (1 in 1,000) were given subcutaneously. The tonic state was followed by clonic jerking of the limbs and head. The appearance was that of mottled cyanosis superimposed on underlying pallor. The eyes deviated to the right; respiration became slower and laboured; the pulse was impalpable; the clonic jerking became weaker. The last breath and movement occurred approximately three minutes after completion of the injection. Artificial respiration proved unsuccessful.

Autopsy was carried out by the Department of Health and Home Affairs. Three pints of fluid were present in each pleural cavity, and the lungs showed moderate œdema. The myocardium, valves and coronary arteries appeared normal. The right kidney weighed 8·5 ounces, the left 5·0 ounces; the capsules stripped easily, a smooth surface being left. The liver was congested and the abdomen contained two pints of fluid. Unfortunately no histological studies were made.

Discussion.

A considerable literature has accumulated in regard to both immediate and delayed toxic effects of the mercurial diuretics.

Wexler and Ellis,[1] writing in 1944, record two fatalities in sixteen months at the Boston City Hospital, during which period 5,200 ampoules of "Mercupurin" were used. They also state that it is only within the past two years that widespread interest has arisen concerning these accidents. All immediate fatalities have followed employment of the intravenous route, but it would appear that of those recorded, only three have resulted from the first injection.

Pines, Sanabria and Arriens,[2] as a result of experimental work on dogs, have shown that death is due to direct toxic action of the mercurial compound on the myocardium of the ventricles leading to ventricular fibrillation, cerebral symptoms being a purely secondary effect of circulatory failure. (This is also the conclusion of other investigators.) They hold that the addition of 0·5 millilitre of a 20% solution of magnesium sulphate to the mercurial diuretic prevents fatal reactions and increases the diuresis; they suggest its use whenever the intravenous route is chosen. This is a welcome discovery, as intravenous injection has several advantages over intramuscular injection; with proper technique it is painless, and free from the risk of producing tissue necrosis when a needle of inadequate length fails to enter muscle owing to gross subcutaneous œdema.

Of the four fatalities accompanying the first injection three have occurred in patients suffering from nephrosis; furthermore, nephrotics appear to provide the majority of the recorded deaths, yet they must constitute a small percentage of patients treated with mercurial diuretics. The incidence of fatal reactions therefore is much higher in this condition than in any other; but attempts to discover the reasons for this have so far proved fruitless. Irritability of cardiac muscle would be enhanced by inadequate oxygenation, and would thereby facilitate the precipitation of ventricular fibrillation by a direct cardiac poison. Search of the available literature seems to deny the existence of œdema of heart muscle itself, and further, reveals no evidence of hindrance of oxygen transfer by a low plasma protein level; yet alterations in osmotic pressure afford an attractive foundation for theory. The low pulse pressure may have been a factor in this case.

One other point deserves consideration. In view of the fact that aminophyllin is now incorporated in most mercurial diuretics ("Neptal", "Mercupurin", "Salyrgan", "Esidrone") is it possible that at times this drug can be incriminated? Merrill[3] has reported three fatalities immediately following intravenous injection of aminophyllin; but the condition of each patient was such that sudden death might reasonably have been expected as a natural outcome of the disease process. Nevertheless, the manner of death in the subject of this report closely resembles the description of the effect on animals of a fatal dose of caffeine (another xanthine) given by Goodman and Gilman.[4]

Since the incident recorded, 0·5 millilitre of a 20% solution of magnesium sulphate has been added to all intravenous injections of mercurial diuretics given by the author to both cardiac and nephrotic subjects, with favourable effect and complete freedom from untoward reactions of any kind.

Summary.

A fatality is reported following a first injection of a mercurial diuretic by the intravenous route.

Attention is drawn to a recently evolved method of preventing such fatal reactions.

References.

(1) I. Wexler and L. B. Ellis: "Toxic Reactions to Intravenous Injections of Mercurial Diuretics", *American Heart Journal*, Volume XXVII, 1944, page 86.

(2) I. Pines, A. Sanabria and R. T. Hernandez Arriens: "Mercurial Diuretics; Addition of Magnesium Sulphate to Prevent Toxic Effects of their Intravenous Administration", *The British Heart Journal*, Volume VI, 1944, page 197.

(3) G. A. Merrill: "Aminophylline Deaths", *The Journal of the American Medical Association*, Volume CXXIII, 1943, page 1115; correction, *ibidem*, Volume CXXIV, 1944, page 250.

(4) L. Goodman and A. Gilman: "Pharmacological Basis of Therapeutics", 1942.

LATENT PRIMARY BREAST TUMOUR.

By T. R. GAHA,
Hobart, Tasmania,

ALTHOUGH they are readily accessible to examination, mammary tumours occasionally escape recognition. Several such cases are recorded by Kaufmann.[1] R. A. Willis[2] also records a case of a small undiagnosed mammary cancer destroying the thyreoid gland with resulting myxœdema.

In the following case, breast cancer was suspected, but was not detectable clinically.

Clinical Record.

Mrs. M., aged fifty-nine years, called early in December, 1944, to pay an account prior to leaving on a holiday. As she was walking out, she remarked: "I have had a lump under my right arm for two weeks. It was swollen and sore, but it is going down now. As you are so busy I will not bother you about it."

Examination revealed a freely mobile lump, the size of a walnut, low down behind the right anterior axillary fold. No tumour could be palpated in either breast. Blood examination showed the red and white cell counts and the film appearances to be within normal limits.

A skiagram of the chest revealed a rounded shadow in the upper part of the mediastinum "suggestive of a low placed thyreoid gland". No other abnormality was found.

After consultation with a surgeon, removal of the right breast and gland was advised, but the patient declined mastectomy. Biopsy of the axillary gland revealed malignant infiltration. Two weeks later, at the end of December, 1944, radical mastectomy was performed, followed by radium implantation to a total of 3,000 milligramme-hours. Recovery from operation was uneventful, and at the present time March 30, 1945, the patient appears to be well.

Biopsy Findings.

The excised lymph gland measured two centimetres by one centimetre by one centimetre and was almost totally replaced by tumour tissue, microscopic examination of which revealed a highly cellular adenocarcinoma showing no necrosis and little mitotic activity (Figure I).

The right breast appeared normal on external palpation, but deep to the nipple region was found an area of tumour tissue consisting of six round masses from one to four millimetres in diameter (Figure II). Microscopic examination revealed this tumour to be an adenocarcinoma of exactly the same appearance as the lymph gland metastasis (Figure III).

FIGURE I.
Adenocarcinoma metastasis in lymph gland (×840).

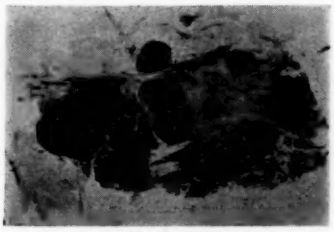

FIGURE II.
Primary breast tumour. The appearances suggest a multicentric origin (×5).

FIGURE III.
Primary breast tumour—an adenocarcinoma (×840).

Comment.

The diagnosis of axillary gland metastatic adenocarcinoma was readily made, but the problem was to trace the primary neoplasm. Removal of an apparently normal breast not only proved justified, but completely changed the prognosis of the case. The tumour appeared to have arisen as a malignant duct papilloma. It was considered unlikely that the mediastinal shadow in the skiagram was caused by tumour infiltration, but this could not be ruled out.

Summary.

A case is presented of axillary gland tumour secondary to a latent primary breast carcinoma, in which mastectomy proved justified in the absence of a palpable tumour.

Acknowledgements.

I am indebted to Dr. C. Duncan, Commonwealth Health Department, Hobart, for the photomicrographs.

References.

(1) E. Kaufmann: "Pathology for Students and Practitioners", Translation by S. P. Reimann, 1929, page 1800.
(2) R. A. Willis: "Secondary Neoplastic Destruction of the Thyreoid Gland Resulting in Myxœdema", THE MEDICAL JOURNAL OF AUSTRALIA, Volume I, 1931, page 349.

Reviews.

THE HEALTH PROBLEMS OF EASTERN PACIFIC COUNTRIES.

THE authors of "Global Epidemiology", Simmons, Whayne, Anderson and Horack, are to be congratulated on having made available such a wealth of detailed information about the health problems of eastern countries and those in the Pacific.[1] Since it was known that disease can deplete a fighting force to a far greater extent than war wounds, there was established in the Preventive Medicine Service of the Office of the Surgeon General, United States of America Army, a special unit known as the Medical Intelligence Division, to which was entrusted the task of collecting and assembling data regarding medical, health and sanitary conditions in all areas to which troops might conceivably be sent whether in a belligerent or friendly capacity. The results have been presented on a definite plan in the book which comprises two parts—Part I dealing with India and far eastern countries, and Part II with countries in the Pacific area. The countries are arranged in alphabetical order, and for each there is a description of the geography and climate, public health activities, medical facilities, diseases, with a final short summary. For each country an extensive bibliography is supplied. Maps of the Far East and of the Pacific area focus the geographical location of the countries and islands, while a series of maps show the world distribution of the principal tropical diseases. An excellent index is provided.

The chapters on geography and climate serve as a useful introduction to the health services in the various countries which are seen to differ considerably in their method of organization, but whatever the type, emphasis is laid on the unsatisfactory state of water supplies and sewage disposal and on the consequent high incidence of intestinal infections and parasitism. It is not only in eastern countries that the authors are critical of these essential public services, for they draw attention to the fact that although the larger capital cities of Australia "have modern plants for the treatment of water and adequate supervision of their water supplies, in many cities filtration is employed, but in most places where it is used it is inadequate". The dependence of small towns on untreated water from presumed uncontaminated watersheds is regarded as responsible for the frequent occurrence of epidemics of diarrhœa after heavy rains. Writing of sewage disposal in Australia, the authors say the methods are primitive excepting in the larger cities and towns. Of New Zealand on the other hand, it is said that there is no town with a population of 2,000 or more which does not have a water-borne sewerage scheme.

[1] "Global Epidemiology: A Geography of Disease and Sanitation", by James S. Simmons, B.S., M.D., Ph.D., Dr.P.H., Sc.D. (Hon.), Tom F. Whayne, A.B., M.D., Gaylord West Anderson, A.B., M.D., Dr.P.H., Harold M. Horack, B.S., M.D., and collaborators; Volume I: Part I, India and the Far East; Part II, The Pacific Area; 1944. London: William Heinemann, Limited. 10" × 7", pp. 534. Price: 30s. net.

Sanitary conditions in Fiji were found to be better than those in other Pacific islands, but despite this, soil pollution is a major problem. References are made to the widespread use of the bored-hole latrine and its value in reducing the risk of intestinal infections. The paragraphs on medical facilities show that the number of hospital beds is everywhere far below United States standards. In regard to diseases, the fact that malaria is a major public health problem not only in India and far eastern countries, but in the Netherlands East Indies, Philippine Islands, New Guinea and certain other islands in the Pacific group, is well brought out. The authors point out that the New Hebrides Islands mark the limit of extension of autochthonous malaria in the Pacific Ocean to the south and east. Attention is drawn to the ravages of the disease during the construction of the Burma Road, and the authors go further than Sinton, who some years ago stated that 100,000,000 cases of malaria develop annually in India and cause 1,000,000 deaths.

Outside the malaria zone in the Pacific the widespread incidence of filaria is noted and attention is drawn to the different vectors of *Wuchereria Bancrofti* and *Malayi*. In this zone also yaws is found to be present as well as in New Guinea, Netherlands East Indies, Malaya and the Philippines. The major quarantinable diseases, plague, cholera, smallpox and yellow fever, receive adequate attention. In regard to plague in Java, the two measures of control, namely, house improvement to build out the rat and the annual inoculation on a large scale with Otten's non-virulent living vaccine, are the subject of comment.

Cholera finds the conditions suitable for endemicity in India and China, where epidemic explosions are apt to occur, as the surveys show with population movements associated with pilgrimages. The endemity is put down to unsatisfactory environmental sanitation, confirming Wu Lien Teh's dictum that cholera remains endemic only in those eastern countries where water supplies and sewage disposal are unsatisfactory.

Little space is given to smallpox, which in some eastern countries is well controlled. No mention of the disease appears to have been made for India, although it is on record that the disease caused approximately 400,000 deaths in the five-year period 1900-1904 and approximately 340,000 in the five-year period 1935-1939.

The widespread distribution of the vector of yellow fever (*Aëdes ægypti*) is mentioned as a potential danger should the disease be introduced into eastern countries. The authors also consider that the introduction of cholera into Australia from the Far East cannot be disregarded in these days of rapid air transportation. That plague may be introduced is also a possibility, and the authors, no doubt having sylvatic plague in mind, mention wallabies and other species of kangaroo as potential reservoirs of the disease once infected.

Typhus is found to be present in a number of eastern countries, but it is in Northern China a louse-born disease, and in other countries either a flea-borne or a mite infection.

Special stress is laid on the ravages of tuberculosis throughout eastern countries and Pacific islands. In certain of the islands, such as the Philippines, the disease ranks as the greatest single cause of death. In the Solomons it is stated that 75% of the population react positively to the tuberculin test. It is a serious problem in Hawaii, and is of paramount importance in French Oceania, and a formidable health problem in Fiji. It is widespread on the East Asiatic mainland and is prevalent in Malaya, where it is a house disease spread by the overcrowding and indiscriminate spitting found among certain oriental races. Nor is it less serious in Japan. The use of "B.C.G." vaccine on an extensive scale in French Indo-China was noted, as was the prevalence of the disease in the cervical glands in the Gilbert Islands.

Venereal diseases were prevalent in all countries and were stated to be problems of the greatest magnitude in French Oceania. Both there and elsewhere native customs play a part in the spread of these diseases. In Japan also, despite the control of prostitution, the disease rates were found to be ten times those of the white population of urban areas in the United States.

On the question of nutrition, the surveys show that the countries on the Asiatic mainland as well as of the more populous island groups such as the Philippines and the Netherlands East Indies, are cereal-consuming countries with rice as the principal cereal. Milk does not enter into the diet of the native populations of these countries, nor is meat generally eaten. As a result, there is a deficiency of protein, especially animal protein. In consequence of the preference for white rice which was found so common, beriberi is reported from many of the countries surveyed, especially in parts of China, French Indo-China, Malaya, parts of India, Thailand and the Philippine Islands. In Northern China, where the diet is low in vitamin *D*, cholesterol osteomalacia is frequently seen among married women.

Pitcairn and Easter Islands, with no public health services, are reported to be free of most of the diseases prominent elsewhere, which indicates that an isolated population may remain in good health in the absence of introduced disease.

The effectiveness of public health measures depends in part on the types of population, their traditions, superstitions, religious prejudices and distrust of western medicine. Nowhere perhaps is this better illustrated than in India, where the authors found public health work hampered by these conditions, and also by lack of expenditure and trained personnel. This applies also to China with its vast population, but here, despite civil wars, the remarkable efforts of the National Health Administration come in for well-deserved commendation.

The native population in Ceylon, Malaya and Netherlands East Indies as well as other island groups have visual evidence of the value of western medicine in the treatment of yaws. The Malay still tends to fight shy of hospitals, in contrast to the Chinese population of these countries, which accepts western medicine, while taking a little of their own, just on chance.

Death rates in Australia were found to be comparable with those in the United States, while in New Zealand the effectiveness of the public health system as a whole is reflected by the fact that New Zealand always has had one of the lowest death rates in the world. Reference might also have been made to the very low infant mortality rate which has pertained in New Zealand for a number of years.

The comments on the relative effectiveness of the public health systems in operation in three large colonial possessions are of interest. The services in French Indo-China are regarded as superior to those in Burma and Thailand, and to compare favourably with those of the Netherlands East Indies. In this last-mentioned country wide scope and originality were found in preventive medicine and public health. Of British Malaya it is said that the programme was considered to have been very effective, especially in the reduction of epidemic diseases. Each of these colonial possessions has been putting into effect a public health and medical programme based on the views held by the French, Dutch and British authorities as to how best serve and protect the health of a large native population whose own ideas of health and sanitation were primitive in the extreme. There are marked differences in the organizations, but the authors have found the results satisfactory in each.

The authors have taken so much trouble to sort out the mass of information available to them and have been so successful in their presentation of it, that it would be ungracious to criticize the result. The following remarks are therefore intended as suggestions for consideration of the authors when the next impression is undertaken. A notable omission is the absence of a separate chapter on the British Crown Colony of Hong Kong, which receives only scanty notice in the chapter on China.

If there is any defect in this book, it is because of the high standard to which those who conducted the surveys have been accustomed. Eastern countries with their enormous population of 1,000 million persons living in overcrowded conditions cannot attain United States standards without the expenditure of much money, the introduction of much trained personnel and the lapse of much time. It is thus of doubtful value, for instance, to make comparisons of hospital and medical services between these countries and the United States, or to compare conditions with those in Great Britain or European countries. To give one example, death rates from typhoid and paratyphoid fevers and dysentery in Singapore are compared with those of England and Wales for 1935, at which time the population of approximately 500,000 people in Singapore was made up of not less than 28 different nationalities, of whom not more than 12,000 were of European descent. One small point, the common housefly *Musca domestica* is fortunately not a problem in Malaya. And finally, may we be permitted to ask whether the statement in the chapter on Philippine Islands that "the effective application of public health and sanitation measures to all these people was a monumental achievement and one which has not been equalled in that part of the world except possibly by the Dutch efforts in the Netherlands and East Indies", is one of those instances to which the authors refer in their introduction where "a sense of local pride may have coloured scientific writings". This is altogether an excellent textbook which should find a place on the bookshelves of every public health officer and every medical practitioner east of Suez.

The Medical Journal of Australia

SATURDAY, APRIL 27, 1946.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

A REPORT FROM GREAT BRITAIN ON A COMPREHENSIVE DENTAL SERVICE.

In December of last year a good deal of space was devoted in these pages to the problem of dental health in Australia. Reference was made to a report of the Parliamentary Joint Committee on Social Security and also to evidence given before it by the Australian Dental Association. The seriousness of the problem in this country may be summed up in the statement that 75% of the people in the community receive no dental treatment whatever, or only such treatment as is required for the relief of pain, and that the dental personnel of the Commonwealth will have to be at least trebled if any demand for a national standard of dental fitness is to be met. The subject of dental fitness has been causing a good deal of concern in Great Britain, and in April, 1943, an Inter-Departmental Committee on Dentistry was appointed to make investigations. The terms of reference mentioned four matters on which the committee had to report:

(a) the progressive stages by which, having regard to the number of practising dentists, provision for an adequate and satisfactory dental service should be made available for the population;

(b) the measures to be taken to secure an adequate number of entrants to the dental profession;

(c) existing legislation dealing with the practice of dentistry and the government of the dental profession;

(d) measures for the encouragement and co-ordination of research into the causation, prevention and treatment of dental disease.

In an interim report presented in October, 1944 the committee recommended that a comprehensive dental service should be instituted as an integral part of the national health service at its inception, that special steps should be taken to secure the availability of dental care for expectant and nursing mothers, children and adolescents, and the encouragement of the groups of persons by all possible educative and persuasive means to seek that care. The committee has now presented its final report; it was presented to parliament by the Minister of Health and the Secretary of State for Scotland in February, 1946.

Considered in regard to Australian needs, the most important part of this final report has to do with the second of the terms of reference—the measures to be taken to secure an adequate number of entrants to the dental profession. The committee opens its discussion on this subject with the statement that it is impossible to state accurately how many dentists it would ultimately be desirable to have practising in Great Britain. Too many doubtful factors are involved, such, for instance, as the rate at which public enlightenment will increase, the effect of changes in the national diet, the progress of dental research and its reflection in dental education and the results of making better provision for the treatment of the "special classes". This statement needs to be amplified. Public enlightenment will increase almost certainly with the number of recruits to the dental profession if these recruits are set to work in such services as the school inspection services carried on in Australia. Last December we pointed out that the whole-time attention of 600 dental surgeons would be needed for one year to give the initial treatment that is required by 300,000 Australian children. No one will doubt that if all the school children in the country could receive adequate dental treatment, the adults of the community would not fail to be "enlightened" regarding its value. In spite of its doubt regarding the factors named, the committee thinks that until there are 20,000 dental surgeons in practice in Britain there is no likelihood of securing entrants to the profession more quickly than they are needed. To achieve this total of 20,000 it will probably be necessary to have an annual intake of 800 into the profession. On account of the number of students who fail to qualify, the number entering on their studies would probably need to be nearer 900. In the years immediately preceding the war the average annual entry into the profession was about 340. The committee adds that, however urgently all possible steps are taken, a number of years will elapse before an annual entry of 900 students can be expected. Some interesting remarks are made on the factors which weigh with boys and girls and their parents in the choice of a career. We read that boys and girls who have any choice in the matter look in the first place for a career in which they can hope to find interest and possibly excitement in their work, and to win recognition and an assured position in the community. They want attractive work and congenial conditions, and then they look at the financial rewards both immediate and of longer term. The committee thinks that dentistry may not be suggested to a boy or girl as a possible career, and that if it has been suggested it may be dismissed "as not appearing to offer adequate attractions or to be generally recognized as of importance". A comparison is made between the financial rewards of careers in dentistry and in medicine; the rewards are lower in dentistry, and this is noticeable particularly in salaried posts. Many will agree that this disparity should not exist in salaried posts. In private practice, if there is any disparity, it is probably the result of overhead expenses in the running of a practice and of the type of work which the dental surgeon has to do and the amount of time which it necessarily takes. The committee thinks that working conditions are likely to be compared with those of medicine, and adds that any

dentist will testify to the strain of continuous application to precise operations and the confinement to the chair-side. Some persons are more gifted than others in the ability to pay continuous attention to small details, and it is persons of this kind who should choose dentistry as a career. The committee neglects to point out that a dental surgeon generally ends his day's work when he leaves his surgery. He is not called from his bed on several nights in the week to attend to obstetric engagements or other emergencies. A man who is not prepared for life of this kind had better not choose medicine as his career. By all means let readjustments be made in salaried posts of dentists and doctors whose work is comparable and whose responsibilities are equal, but let us not confuse the issue in regard to work that is not comparable and responsibilities which are not equal. To do so will not put dentistry in the favourable light in which it should appear. The measures suggested to bring recruits to the profession are of two kinds. First, it is held that boys and girls should have a career in dentistry brought to their notice as a possibility by schools, by government departments, and also by dental schools which "should make themselves as well known as possible to potential students". The second group of measures includes those for making the career more attractive in itself. The fundamental factor is stated to be the public appreciation of the relation between dental disease and general health in the creation of a demand for dental service. With this medical practitioners will readily agree. The committee is anxious that the dental profession shall stand high in the public estimation. If it is so held, then recruits are likely to be forthcoming. On the matter of remuneration, too, it is insistent; particularly is it important "that dental appointments should compare with those available to medical personnel, more favourably than they do at present, as regards status, remuneration and opportunities for promotion". The committee has a good deal to observe about conditions of work, and this is doubtless of great importance because of the legislative changes contemplated in Britain in the near future. We agree that no boy or girl who wishes to be a dentist should be debarred by lack of means from receiving the necessary training. In regard to the training itself we also agree that young people are not attracted by a training of inferior standing, and we agree further that if the educational entry standard is not satisfactory, there will be all the more who will have to abandon the course at a later stage. That the shortest possible curriculum compatible with the maintenance of a satisfactory standard of training should be devised, is only common sense. Before we leave this part of the report we cannot refrain from stating our impression that a little too much is made of the status of a profession, of how it is regarded generally, and therefore of the standing which those who belong to it will have in the community. Surely the time is coming—and this is certainly true of the Commonwealth of Australia—when a man is regarded by most people for what he is and not for what stratum of society can claim him or for what hall-mark he has managed to acquire. The dignity of work, both inside and outside the professional ranks, is acknowledged much more widely than it used to be. A man who does his job of work, whatever it happens to be, efficiently, with a sense of responsibility and with dignity, is recognized as a man of worth by those around him. Even those who are unwilling to say so in as many words know in their minds that it is true.

A good deal of space has been given to one of the sections of this interesting report. Some of the other sections must be mentioned briefly. Some of the points are applicable only to Great Britain. It is held that all dental schools should be integral parts of universities and that they should be legal entities distinct from, though closely associated with, their hospitals. The close relationship of dental to medical schools also will benefit the students of both. Of course, if numbers of students are to be increased substantially, the schools of dentistry will need to grow in size and in number. This is particularly true of Australia. Post-graduate training is discussed and dental research has a good deal of space devoted to it. It is stated that the Medical Research Council should continue to regard dental research as falling within its province, but that it should be advised by a reconstituted Dental Research Committee. Ancillary workers such as dental mechanics and dental attendants and their respective spheres are discussed.

Though this report is of most interest to dental practitioners, it should engage the attention of members of the medical profession. Preventive dentistry is really part of preventive medicine, and as every member of both professions knows, the work of doctor and dentist is often closely interwoven. There is not nearly enough collaboration in the academic sphere, in the exchange of ideas, between the two professions. This has been shown in the compilation of the report that has been discussed. The committee drawing up the report received oral evidence from thirty-five organizations and individuals. Their names are set out in a special appendix. The Society of Medical Officers of Health gave evidence and the names of medical men appear in connexion with other bodies. The name of the British Medical Association does not appear. It would be interesting to know why this omission occurred.

Current Comment.

CONVALESCENCE AFTER SURGICAL PROCEDURES.

SOME time ago attention was drawn to an American symposium on the abuse of rest, whose text was the drawbacks and even the risks of an unduly long period of bed rest after the acute disabling stages of illness had passed. Though individual opinions still differ widely, there is undoubtedly a tendency for periods of bed rest in such cases to be shortened. The question of the management of the convalescent once he rises from his bed is quite another matter. Isaac Starr and Robert L. Mayock have made some studies of the circulation and other observations on convalescents from surgical procedures.[1] They remark that it is obvious that a patient who has been through any surgical ordeal, even if a comparatively mild one such as a herniorrhaphy, is not in normal health or of normal activity, even allowing for his existing disability. Routine observation shows nothing actually abnormal during this period; therefore Starr and Mayock have tried to find some methods of investigation which might be used as a test of deviations from the normal in such subjects. Forty-four patients were studied in this series before and after surgical operations. A number of them had undergone herniorrhaphy under spinal anæsthesia. Observations of the cardiac output were measured by the ballisto-cardiograph before operation, and the usual clinical

[1] *The American Journal of the Medical Sciences*, December, 1945.

estimations of blood pressure and heart rate were made. These were repeated six days after operation and at close intervals thereafter, some variations being, of course, necessary for patients not able to be tested. Position tests were applied where possible. The effect of mild suitable exercise was also observed by calculating oxygen utilization. Control observations were made on healthy persons. The authors in conjunction with Marjorie G. Battles concentrated on the effects of this exercise test, as it seemed possible that some useful standardized method might be evolved therefrom.[1] It was found, however, that the physiological response to exercise was so variable that there appeared little hope of devising any useful test on this basis. No significant differences could be detected in the magnitude of changes induced by exercise, but the duration of even small changes was found to be far more constant and important. Increased oxygen consumption and respiration and pulse rate returned to the resting level more slowly during convalescence than before operation. Apart from these efforts to evaluate the exercise response of the body, some differences were found in the behaviour of the circulation and the general muscular tone. After operation, the cardiac output declined when the patient was in the horizontal position, though it tended to rise when he was in the vertical position, just as the pulse rate rose, though the blood pressure fell. The administration of large amounts of fluid by vein and securing a high degree of nutrition, where post-operative conditions allowed it, tended to prevent these circulatory changes. Tremor was frequently noticed in patients able to be tested in the standing position. An attempt was made to accelerate convalescence as tested by these standards. A group of ten patients after operation for hernia were encouraged to get up after a few days and suitable exercises were prescribed. These tolerated the upright position better than control patients who were not exercised, but the advantage disappeared in a day, and, therefore, was negligible. Incidentally, all surgeons would not approve of such a programme for the subjects of herniorrhaphy. Where does this leave us? Much where we were before, but we have in this work proof of the existence of disturbances in the chief bodily functions after operations. No doubt it is an excellent thing to get the patient up after what careful unbiased observation indicates as the optimum time after operation and not to keep him unduly long in the unnatural state of total bed rest. But even when up, he is only beginning his true convalescence, and while correctly planned exercise and occupational treatment will return him more promptly to normal life, he must be given such time for this recovery as judgement and controlled experience prove adequate.

UNUSUAL ŒSTROGEN REACTION IN A BOY.

IN the March 10, 1945, issue of the *Schweizerische medizinische Wochenschrift* just to hand, R. Wenner, of the Basel University Frauenklinik, describes the remarkable case of a boy of fifteen reacting to stilbœstrol. The lad was employed in a factory where this œstrogenic drug was manufactured in quantity. He consulted a physician on account of some curious happenings in his mammary region. When examined there were distinct mammæ, convex and firm; each nipple was pigmented and surrounded with a dark-brown areola 2·5 centimetres in diameter. A photograph shows a graceful torso which suggests a girl of fourteen or fifteen, but with very dark nipples and areolæ. The scrotum had also become darker and the testes were small. The boy was removed from contact with stilbœstrol, and after four weeks showed a very slight diminution in the size of the mammæ and of the diameter of each areola. Perandren was then administered in doses of five milligrammes per day, and after four weeks the breasts were normal and the areolæ, though still pigmented, were smaller; the scrotum had lost some of its colour and the testes had grown perceptibly. Inquiry showed that the boy had been working with stilbœstrol in alcoholic solution and also in powder form; doubtless an occasional drop or two of the solution might have fallen on his hands; but it was the powder which was finally considered responsible, for the particles are exceedingly fine and could easily gain access to nose and mouth. Examination of the urine for œstrogenic substances gave a negative result, but this was not carried out until the boy had been eight days away from the factory. It may be suggested that this curious occurrence is likely to evoke some anxiety in certain quarters, perhaps among male gynæcologists who deal extensively with œstrogenic products. It would be quaint if they ended by resembling their patients. However, it appears that the victim in this case was at the age of puberty, a period of instability of sex characters, both primary and secondary. The adult male we may assume to be immune. In all seriousness it would be wise, as the author states, if boys at this time of life were not allowed to work at the manufacture or other handling of œstrogenic agents, for some happenings might arise worse than those here recorded.

[1] *Ibidem.*

BONE AS HUMAN FOOD.

FOOD FADDISM is not, we must sorrowfully admit, confined to the lay public. The rival claims of 100% extraction and 85% extraction flour have been debated with some dogmatism and even some acerbity by members of the medical profession. Now we find in a reputable Swiss medical journal a serious recommendation that human beings through not eating bone are missing calcium in proper combination and association.[1] That calcium phosphate is better than calcium carbonate or lactate we shall all concede; further, as we are now fully aware, vitamin *D*, either obtained in food or formed endogenously by ultraviolet irradiation, is necessary for proper bone growth. The author points out that dogs given bone are healthier than those deprived of this item in canine diet; but he forgets that calcium phosphate in the dog has another function than yielding useful mineral matter to the blood stream, for it acts in the intestine as cellulose does in the human being—that is, as roughage or ballast. Further, the pressure on the teeth has some beneficial action in dental metabolism. He also conveniently omits to mention that there are vegetarian animals, in which bone eating is pathological. Dogs given bone, so the author informs us, can snap at bees and wasps with impunity; a human being given sufficient calcium in proper form is, he also claims, resistant to many allergic reactions, to many pathological conditions of bone and tooth, to a number of infections and to insect bites. Our jaws and teeth were once stronger; but with the "regression of the snout" we have lost the faculty of crunching "even the tender bones of the calf"—whether these were eaten raw or cooked we are not informed. The author makes the extraordinary suggestion that we ought to eat the organic matrix of bone, ossein in fact, which constitutes one-third of the solid matter in bone, as well as the mineral components. Exactly how this would benefit calcium phosphate absorption and utilization is not made clear. We may still venture to believe, when witnessing the rapid bone growth of the calf, that the calcium of milk is given in the right form—that is, combined with phosphate in the proper proportion. If some of the patients in the Berne hospitals are asked to consume calcium in the form of ground bone, we shall raise no objection; but for ourselves we shall continue to prefer our calcium phosphate as nature has presented it, in milk or in the disguise of tasty cheese.

[1] Julius von Ries: *"Entspricht die jetzige Darreichungsform der Kalkpräparate dem physiologischen Körperbedürfnisse?"*, *Schweizerische medizinische Wochenschrift*, March 10, 1945, page 217.

DR. J. G. HUNTER FLIES TO ENGLAND.

THE arrangements forecast last week have been completed. Dr. J. G. Hunter, General Secretary of the Federal Council, is due to arrive in London on April 28 to attend the Special Representative Meeting on May 1.

Abstracts from Medical Literature.

SURGERY.

Penicillin Therapy in Fracture of the Femur.

S. A. Collom and W. M. D. Ewing (*Annals of Surgery*, November, 1945) report their experiences with 100 cases of fracture of the femur seen in the Italian campaign and followed until evacuation of the patients to the United States. Eighty-two of the fractures were compound. Approximately half of the patients were given penicillin, and the authors present a comparative study of the results, together with an account of the methods of treatment. They stress the importance of adequate and early surgery in forward areas in the prevention and control of infection, and the necessity for resuscitation with plasma or whole blood. In the majority of cases realignment of fragments was achieved by skeletal traction. Internal fixation with plates and screws was carried out in 23 cases (nineteen compound and four simple fractures), in only one of which was the removal of the plate required. The authors conclude that while penicillin and blood are valuable aids in the prevention and management of infection, they are unavailing without good surgery.

Gelatin Sponge and Thrombin.

R. U. Light and Hazel R. Prentice (*Archives of Surgery*, September, 1945) describe gelatin sponge as an alternative to fibrin foam as a thrombin carrier for hæmostatic use. After pointing out that thrombin is the most suitable and potent agent for hæmostasis, they discuss the various absorbable carriers available; gelatin has the advantage of being a non-specific universal protein devoid of antigenicity and procurable from any animal, and it has been found possible to "foam" it into an efficient sponge which can be wetted, wrung dry, and refilled repeatedly without disintegration. A millilitre of gelatin weighs only 9·0 milligrammes, but will absorb 0·5 gramme of water or blood. It can be cut with a scalpel without fragmentation. Animal experiments were carried out, the gelatin-thrombin sponge being applied to the cortex and buried within the brain. The sponge was also used to patch openings deliberately made in the sagittal sinus. Direct contact with brain tissue provoked only a minimal cellular response which was no greater than that resulting from fibrin foam, and where the sponge was used to cover deficiencies in the wall of the superior sagittal sinus, it was found that no intravascular clotting had occurred. The authors consider that the thrombin solution, into which the sponge is dipped, should be neither too weak nor too strong. In the former event blood will pass through the sponge before being coagulated, while too powerful a concentration of fibrin will cause the rapid formation of a very thin layer of clot at the contact surface of the sponge. It is desirable that the blood should permeate the sponge and then clot. A series of experiments failed to show any antigenicity on the part of the hæmostatic agent, although high concentrations of thrombin were employed. Clinical experiences were gained with 24 neurosurgical operations, and the material was found to be exceptionally efficient and reliable in controlling the types of bleeding for which it was suitable (oozing and venous bleeding). The authors use the sponge in layers four to six millimetres thick, and wring it out of a solution containing thrombin, 100 units per millilitre. The authors point out that the method described constitutes a "patch technique" which is not dependent on human blood for its material.

Concussion of the Spinal Cord.

R. A. Groat, W. A. Rambach, junior, and W. F. Windle (*Surgery, Gynecology and Obstetrics*, July, 1945) discuss the term concussion of the spinal cord. They point out that it is applied in the most vague way, so that it has become practically useless as an indication of any lesion. They conducted an investigation to clarify the functional and morphological aspects of uncomplicated spinal cord injury. Cats were used, and blows were struck at various levels, the instrument being garnished with chalk to mark the exact level of injury. The severity of the concussion was measured by the magnitude of increase of the threshold for a femoral sciatic reflex and the duration of the recovery time. The effects of the blow varied at different levels, and these are described in some detail. Histological studies were rigidly controlled. Animals were perfused with formalin immediately after the blow and subtle changes were observed among all cells except the motor neurones. The chief alteration was chromatolysis in the nerve cells immediately underlying the site of the blow. The authors claim that a special term should be invented for cases in which functional disorders are associated with histological changes, and that the term concussion of the brain or cord should be restricted to a definite clinical picture.

Thenar Palsy.

R. B. Zachary (*Surgery, Gynecology and Obstetrics*, August, 1945) discusses the syndrome characterized by gradual atrophy of the thenar eminence, the result of paralysis of the *adductor brevis* muscle and the *opponens pollicis*. Sensory disturbances may be present and usually the patient is past middle age. The explanations offered are pressure on the motor branches of the median nerve at the distal end of the anterior carpal ligament, phylogenetic susceptibility of the thenar muscles, compression of the median nerve in the carpal tunnel and spinal lesion. The partial nature of the lesion is due to the ulnar innervation of the *flexor pollicis brevis*. The sparing of the sensory fibres is due to a selective action of the trauma affecting the large fibres (motor) predominantly, and thus producing a dissociated type of lesion. Division of the anterior carpal ligament is suggested as a means of relief.

Substernal and Intrathoracic Goitre.

A. W. Blain and A. De Matteis (*The American Journal of Surgery*, August, 1945) discuss the distinction in nomenclature between substernal and intrathoracic goitre. Intrathoracic goitre is an adenoma which has formed in the lower pole of one side of the gland and, assisted by the upward and downward movements of the trachea during swallowing, has followed the path of least resistance and become a source of obstruction to the structures of the lower cervical region and the upper limit of the thoracic cage. A true intrathoracic hypertrophy of thyreoid tissue is extremely rare, and has not been seen by Lahey in 14,000 cases of thyreoidectomy. Unless distortion of the trachea is present, local infiltration is relied upon in all cases for anæsthesia. If distortion is present a hard rubber tube is inserted into the trachea under ether or other inhalation anæsthetic alone. Local anæsthesia has the advantage that the patient is free to cough up any accumulation of mucus during the operation. The operative procedure recommended by the authors follows usual lines, but section of the ribbon muscles is advised, and morcellation of the lower portion of the gland in suitable cases. The greatest advantage is the prevention of unexpected rupture of vessels when the finger is passed around the gland within its capsule and control of the end of the bleeding vessel is thus lost. The desire to remove the tumour intact must be resisted, as bleeding in this region is extremely serious. If a large cavity is left it is packed with gauze, which is removed slowly, commencing about two days and finishing up eight days after operation. If malignant disease is suspected, morcellation is not desirable. The authors stress the necessity of refraining from passing the finger around the gland in all cases, traction being made upon the gland to expose the vessels and control bleeding. The diathermy knife has been found useful in difficult cases in conjunction with morcellation.

Sucking Wounds of the Chest.

C. S. Welch and J. E. Tuhy (*Surgery, Gynecology and Obstetrics*, August, 1945) report their experiences with seventy sucking wounds of the chest, of which twenty-one were thoracico-abdominal. All patients known to have sucking wounds were treated in shock wards and oxygen was given if necessary for dyspnœa and cyanosis; they were left on the stretcher on which they had arrived until they were in the surgical department, and in some cases until after operation. The blood pressure and pulse rate were determined immediately and at frequent intervals as the best guide to prognosis. Transfusions of citrated stored blood were started as soon as possible. The authors describe the amounts of blood given and the rationale of their methods; they specially draw attention to the danger of pulmonary œdema if the blood is diluted with saline solution *et cetera*. Delay in the giving of transfusion was never countenanced merely because the bleeding had not been stopped. The posture of the patient is important; the injured side should be down if much hæmoptysis has occurred or rib fractures are present. Anæsthesia was by nitrous oxide and oxygen and ether, preceded by atropine and morphine except in the poor risk cases. After operation the trachea and bronchi were aspirated with a catheter, or by bronchoscope. Some patients were given local anæsthesia; "Pentothal Sodium" was used for others, but is not recommended in the presence of any respiratory difficulty. Three principal types of operative interference

are described—wound *débridement* and closure of the chest opening, thoracotomy, and thoracotomy with transdiaphragmatic exploration of the abdomen. Sixty-four of the patients were operated upon. The post-operative treatment is directed toward the correction of respiratory and circulatory disturbances, reexpansion of the lung, and the prevention of infection.

Penicillin in Acute Osteomyelitis.

I. W. J. McADAM (*The British Journal of Surgery*, October, 1945), in a paper which incorporates many tables, illustrations and reproductions of charts, discusses the value of penicillin in the treatment of acute hæmatogenous osteomyelitis. A daily dose of 100,000 units of penicillin was given, except in cases of septicæmia, in which 200,000 units were given, until the septicæmia was controlled. The daily dose was given in 100 millilitres of normal saline solution by continuous infusion, either intramuscularly or by intramedullary needle, into the diaphysis of the infected bone. When the intramedullary route is used the needle can be left for twenty-one days; whereas with the intramuscular route the site must be changed every second day. The aim of the intramedullary route is to maintain a high local concentration, while securing sufficient absorption to control general infection. Details of the methods of estimating the level of penicillin in serum or pus are given, and the results are set out in tables. All patients received 100,000 units of penicillin per day irrespective of their age, causing a wide variation in the serum bacteriostatic level. The intramedullary method of administration would seem particularly suitable where the infected metaphysis is intracapsular, as in the neck of the femur, and there is an inevitable septic arthritis. By inserting the sternal puncture needle into the medulla of the bone, aspiration of a subperiosteal abscess is possible, relief of tension when inserted further to penetrate the cortex and a precise bacteriological diagnosis when the pus is examined and cultivated can be obtained. The author deals with the functional results, and the radiological considerations in the progress of the cases. In the paragraph devoted to prognosis the author states that none of the septicæmic patients developed new metastatic lesions after the start of the treatment. Provided the patient is not *in extremis* and the organisms are penicillin-sensitive, recovery can be anticipated in every case of acute hæmatogenous osteomyelitis. In the forty cases investigated, thirty-two patients had infection of the long bones. The mortality was 2·5% in spite of *Staphylococcus aureus* septicæmia in 50% of the cases. The best results were obtained from conservative methods. Radiological evidence supports the view that devitalization has been cellular rather than massive. Large sequestra were absent, there was no massive involucrum formation, bony architecture was maintained and there was no gross deformity.

Primary Segmental Resection in the Left Side of the Colon.

J. M. WAUGH AND M. D. CUSTER (*Surgery, Gynecology and Obstetrics*, December, 1945) report their experiences with fifty patients suffering from lesions occurring in the left half of the colon who were submitted to segmental resection with primary end-to-end aseptic anastomosis. Only two patients died, and one of these deaths was due to pulmonary complications, the anastomosis being found sound at autopsy. In discussing pre-operative preparation the authors insist that primary anastomosis should be attempted only in the treatment of those patients in whom the bowel has been thoroughly decompressed. It was found possible to achieve this in most instances by a suitable *régime* which included the oral administration of succinylsulphathiazole (sulphasuxidine) two grammes five times daily for four days before operation. Previous colostomy was considered unnecessary, although in four cases in the series this operation had already been done. Some tendency to transient post-operative obstruction due to œdema may be encountered in those cases in which the removal of a low-lying lesion has required extensive freeing from the hollow of the sacrum. Here the authors recommend passing a tube *per anum* and through the anastomosis and leaving it for ten days. In all other cases the anal sphincter is dilated to four fingers as an aid to the expulsion of flatus before the patients leave the table. Sulphasuxidine administration is resumed as soon as the patient can take the drug by mouth.

Pulmonary Œdema and Ecchymosis after Hæmorrhage.

R. M. EATON *et alii* (*The Journal of Thoracic Surgery*, October, 1945) discovered accidentally, during experimental studies on pulmonary lymph flow in which controlled arterial bleeding was instituted, that pulmonary œdema and hæmorrhage were regularly produced by the simple removal of moderate to large quantities of blood from the femoral artery; the greater the volume of blood lost, the greater was the pulmonary damage. After the withdrawal of 20% of the blood volume from dogs the lungs became congested and the pulmonary arterial and venous pressures and the peripheral venous pressures were found to have risen. These elevated venous pressures declined to normal within an hour and a quarter of the hæmorrhage. It was found that the pulmonary congestion, which gave rise to increased rate and depth of the respiration, was associated with pulmonary œdema and hæmorrhage; these occurred immediately after the loss of blood, but the hæmorrhages in the lung were not visible to the naked eye for some hours. It was found that intravenous infusions administered during the short period of increased venous pressure caused a further increase in the venous pressure.

Acrylic Resin for the Closure of Skull Defects.

J. M. SMALL AND M. P. GRAHAM (*The British Journal of Surgery*, October, 1945) discuss the material used for closing bony defects, such as silver celluloid, vitallium and tantalum. The main indication for closing a defect is the desire of the patient himself to have a solid covering for his brain, and so to rid himself of a feeling of insecurity and at the same time to improve his personal appearance. This applies especially to the patient with the large frontal defect. Headache as an indication must be carefully considered, such as local pain at the site of the defect aggravated by exertion, and pain referred to the orbits and brought on by exertion or change of posture. The author replaces the missing bone by an acrylic plate which faithfully reproduces the original contour of the skull. Precautions must be taken before operation to ensure the absence of sepsis by the use of such agents as massage and radiant heat which will light up latent foci of infection, and by the excision of doubtful scars. In the case of large defects special flasks are needed, otherwise those used in dental work are quite satisfactory. The impression taken at operation will require to include a margin of at least one inch of bone around the defect in order that the acrylic plate may conform accurately to the skull contour. The operation is, of course, a two-stage procedure. First there is the opening up of the area and the taking of the impression, and secondly, generally on the next day under local anæsthesia, comes the fitting of the prepared plate. Perforations are made in the plate to allow of the escape of blood and body fluids. Calcium-penicillin-sulphamethazine powder is dusted into each layer during the closure over the plate. To hold the acrylic plate in place one or more pericranial flaps are sutured over it. The advantages of this material may be summarized as follows: it is light, tough, inert, radiolucent, and it may be boiled before insertion.

Cancer of the Breast.

E. M. DALAND (*The New England Journal of Medicine*, November 1, 1945), in a discussion of some unusual aspects of cancer of the breast, mentions the occurrence of cancer of the breast in a girl aged fifteen years and in two others aged less than nineteen years, also the recurrence of a cancer thirty-four years after radical mastectomy.

Penicillin in the Treatment of Chronic Osteomyelitis.

J. BUCHMAN AND J. E. BLAIR (*Archives of Surgery*, September, 1945) present a clinical and bacteriological study of 47 patients with 68 lesions due to chronic osteomyelitis. After reviewing the many past disappointments attending the treatment of this condition, they focus attention on the poor vascularity of the parts and on the consequent inaccessibility of the organisms to therapeutic agents carried in the blood stream. It is concluded that the treatment of chronic osteomyelitis with intramuscular injections and local applications of penicillin to the exclusion of surgical intervention is totally ineffective. The fact that penicillin does not gain access to the bacteria was illustrated by the fact that none of the organisms developed penicillin-resistance. Pre-operative and post-operative administration of penicillin does not materially improve the results obtained by thorough "saucerization" of the focus, partly because the "nuisance organisms", *Bacillus proteus* and *Bacillus pyocyaneus*, almost always establish themselves in time. The best results were obtained by the pre-operative and post-operative administration of penicillin, by carrying out a thorough saucerization, and then by performing a primary closure. This method gave good results in 23 out of 27 cases.

British Medical Association News.

ANNUAL MEETING.

THE annual meeting of the New South Wales Branch of the British Medical Association was held at the Robert H. Todd Assembly Hall, British Medical Association House, 135, Macquarie Street, Sydney, on March 28, 1946, DR. E. H. TIVEY, the President, in the chair.

ANNUAL REPORT OF THE COUNCIL.

On the motion of Dr. A. J. Collins, seconded by Dr. L. A. Dey, the annual report of the Council was received and adopted. The report is as follows.

The Council presents the following report on the work of the Branch for the year ended March 28, 1946.

Membership.

The membership of the Branch is now 2,480, as against 2,286 at the date of the last report. The additions have included 231 elections, re-elections and resumptions, and 43 removals into the area of the Branch, while the losses have included 4 by resignation, 40 removals out of the area of the Branch, 9 by default in payment of subscription, and 27 by death. The losses by death were as follows: Dr. T. Ewing, Dr. W. Flower, Dr. F. P. Sandes, Dr. R. Vallack, Dr. Wolfe S. Brown, Dr. R. F. Baird, Dr. L. A. Kortum, Captain R. J. Allsopp, Dr. C. B. MacVean, Dr. G. M. Hains, Captain O. U. Williams, M.B.E., Dr. F. J. Bridges, Dr. C. Retchford, Dr. H. E. Clarke, Dr. R. A. Fox, Dr. D. G. Hunter, Dr. A. McKillop, D.S.O., Dr. A. E. Aspinall, Dr. A. J. Aspinall, Dr. C. M. Swirles, Dr. D. S. Small, Dr. J. W. K. Bruce, Major S. S. Rosebery, Dr. G. McLean, Dr. J. I. C. Cosh, Dr. W. Vickers, D.S.O., V.D., Dr. George Allan.

Roll of Honour.

Died on Active Service.

Captain R. J. Allsopp, Captain O. U. Williams, M.B.E., Major S. S. Rosebery, Captain J. B. Oakeshott.

Francis Percival Sandes.

With the passing of Dr. Francis Percival Sandes, the Association has suffered a great loss. He was a member from 1900 until the date of his death. In 1911, he was elected to the Council of the Branch, of which he remained a member until 1921. During this period he acted as Honorary Secretary for a period of six months in 1913, was chairman of the Medical Politics Committee for two years (1918 and 1919), and was President for the year 1919-1920. He also acted as Branch representative at the Annual Representative Meeting in England in 1910, and during the period 1918-1920 was a member of the Federal Committee of the British Medical Association in Australia, acting as honorary secretary and honorary treasurer in the first two years of this period.

Dr. Sandes also became a member of the Australasian Medical Publishing Company, Limited, in 1916, and was a director from 1923 to 1927.

The Council has placed on record its deep sorrow in the loss sustained by the Association in his death, and has also recorded its appreciation of the services which he rendered the medical profession and the State.

Congratulations.

Congratulations were extended to Dr. F. McCallum on his appointment as Director-General of Health, Commonwealth of Australia.

On the occasion of his retirement as Chairman of the Medical Equipment Control Committee a letter was forwarded to Sir Alan Newton expressing appreciation of the excellent services he had rendered to the nation and to the profession in maintaining adequate supplies of medical equipment to meet the needs of the Services and of the civilian population.

Meetings.

Nine ordinary meetings of the Branch (including the annual general meeting) and one extraordinary general meeting of the Branch and eight clinical meetings were held. The average attendance was 63. Seven of the ordinary meetings were held in conjunction with meetings of special groups, namely: April 26, with the Section of Urology and the Section of Pædiatrics; May 31, with Medical Officers of the Royal Navy and the Oto-Rhino-Laryngological Society of New South Wales; June 28, with the Section of Obstetrics and Gynæcology and the Section of Medicine; July 26, with the Orthopædic Group and the Section of Neurology, Psychiatry and Neurosurgery; August 30, with the Section of Sociological Medicine and the Section of Neurology, Psychiatry and Neurosurgery; October 25, with the Section of Medicine and the Section of Surgery; November 29, with the Resident Medical Officers' Special Group. At the meeting held on September 27, papers were read by medical officers of the Royal Navy. The clinical meetings were held at the Royal Alexandra Hospital for Children, Royal Prince Alfred Hospital, Royal North Shore Hospital, Women's Hospital, Crown Street, Lewisham Hospital, Sydney Hospital, St. Vincent's Hospital and Broughton Hall Psychiatric Clinic. The business of the meetings included seventeen papers, numerous reports of cases, exhibits and demonstrations and the showing of films. By-Law 4 (*a*) was amended at the extraordinary general meeting held on March 22. An invitation was extended to the fifth and sixth year medical students of the University of Sydney to attend ordinary meetings, and to sixth year medical students to attend clinical meetings of the Branch.

Representatives.

The Branch was represented as follows:

1. Council of the British Medical Association (1938-. . . .): Professor R. J. A. Berry.
2. Federal Council of the British Medical Association in Australia: Dr. A. J. Collins, D.S.O., M.C., Dr. W. F. Simmons.
3. Contract Practice Committee of the Federal Council: Dr. H. R. R. Grieve.
4. Australasian Medical Publishing Company Limited: Dr. T. W. Lipscomb, Dr. A. M. Davidson, O.B.E., Dr. L. F. Dods.
5. New South Wales Post-Graduate Committee in Medicine: Dr. A. C. Thomas, Dr. G. C. Willcocks, O.B.E., M.C.
6. Ophthalmic Association Limited: Dr. Colin C. Ross.
7. The Flying Doctor Service of Australia: Representative, Dr. George Bell, O.B.E.; Deputy Representative, Dr. J. G. Hunter.
8. Council of the Bush Nursing Association: Dr. E. A. Tivey.
9. Board of Control of the Campaign against Tuberculosis: Dr. A. S. Walker.
10. Metropolitan Hospitals Contribution Fund of New South Wales: Dr. P. L. Hipsley.
11. Saint John Ambulance Association: Dr. E. A. Tivey.
12. Executive Committee of the Council for Mental Hygiene for New South Wales: Lieutenant-Colonel C. K. Parkinson.
13. Standards Association of Australia: (i) Institutional Supplies Committee, Dr. S. W. G. Ratcliff; (ii) Sectional Committee on Interior Illumination of Buildings, Dr. N. M. Macindoe; (iii) Committee on Standards of Laboratory Glassware and Volumetric Glassware, Dr. F. S. Hansman; (iv) Committee on Protective Glass for Welding; Surgeon Commander J. A. F. Flynn; (v) Committee on Plaster of Paris for Orthopædic Purposes, Dr. L. J. Woodland.
14. Medical Officers' Relief Fund (Federal): Local Committee of Management for New South Wales, Dr. E. H. M. Stephen, Dr. A. M. Davidson, O.B.E., Dr. A. J. Collins, D.S.O., M.C.
15. Police Boys' Club: Dr. E. A. Tivey.
16. Medical Appointments Advisory Committee (Hospitals Commission of New South Wales): Dr. W. Vickers, D.S.O.
17. Australian League of Nations Union—Refugee Emergency Council: Dr. E. P. Blashki.
18. Special Departmental Committee for the Investigation of Maternal Deaths: Dr. A. M. Davidson, O.B.E.
19. Recreation and Leadership Movement: Professor Harvey Sutton, Dr. W. C. McClelland.
20. Council of the Royal Society for the Welfare of Mothers and Babies: Sir Robert Wade, Dr. E. H. M. Stephen.
21. New South Wales State Medical Coordination Committee: Dr. K. S. Parker, M.C., E.D.
22. New South Wales Medical Board: Dr. J. R. Ryan.
23. The Free Library Movement: Dr. E. H. M. Stephen.

24. Workers' Educational Association: Dr. R. A. M. Allen, M.C.
25. New South Wales Institute of Hospital Almoners: Dr. W. Vickers, D.S.O.
26. Council of Education: Dr. A. J. Collins, D.S.O., M.C.
27. New South Wales War Loans and War Savings Certificates Committee: Dr. A. J. Collins, D.S.O., M.C.
28. Overseas Children Citizens' Committee: Dr. J. G. Hunter.
29. Society of Laboratory Technicians of Australasia: Dr. Jean Armytage.
30. Status and Conditions of Nursing Profession: Dr. H. R. R. Grieve.
31. New South Wales Society for Crippled Children: Dr. E. H. M. Stephen.
32. Medical Finance Limited, Board of Directors: Dr. F. Brown Craig, Dr. A. M. Davidson, O.B.E., Dr. A. C. Thomas, Dr. George Bell, O.B.E., Dr. G. C. Halliday.
33. Technical Bodies Advisory Committee on Housing Standards: Professor Harvey Sutton.
34. Housing Problem Committee, Institute of Engineers: Professor Harvey Sutton, Dr. Mary Puckey.
35. New South Wales Institute of Dietitians: Dr. J. K. Maddox.
36. Coordinating Council for the Physically Handicapped: Delegates, Sir Robert Wade, Mr. K. F. Coles; Deputies, Dr. W. Vickers, D.S.O., Dr. G. M. Barron, O.B.E.
37. Road Saftey Council of New South Wales: Council of Management, Dr. E. A. Tivey.
38. Federal Medical War Relief Fund: Local Committee of Management, Dr. A. J. Collins, D.S.O., M.C., Dr. A. C. Thomas, Dr. A. M. Davidson, O.B.E.

Council.

(a) The attendance of members of the Council and of the standing committees was as set out in the accompanying table.

(b) The representatives of the Local Associations of Members, appointed on the invitation of the Council to attend the regular quarterly meetings of the Council, were as follows: Dr. E. P. Dark, (Blue Mountains), Dr. H. A. McCredie (Canterbury-Bankstown), Dr. J. H. Coles (Central Southern), Dr. S. J. Woolnough (Central Western), Dr. S. G. Nelson (Eastern Suburbs), Dr. N. E. McLaren (Eastern District), Dr. L. W. Wing (Far South Coast and Tablelands), Dr. G. F. Elliott (Illawarra Suburbs), Dr. G. L. Howe (Kuring-gai District), Dr. G. C. Halliday (Northern District), Dr. J. R. Ryan (North Eastern), Dr. A. L. Caselberg (South Eastern), Dr. C. H. Jaede (South Sydney), Dr. A. A. Lang (Warringah District), Dr. R. D. Mulvey (Western), Dr. R. J. Waddington (Western Suburbs).

Library.

Dr. J. Kempson Maddox was appointed to the position of Honorary Librarian.

Visitors to the library	5,170
Books lent to members	939
Journals lent to members	3,482
Books added to the library	167
Journals added to the library	12

During the past 12 months the number of visitors to the library exceeded the previous year's figures by 1,458, representing an increase of 40%. The total number of publications lent was 4,421, an increase of 1,198, and the numbers of new books added to the library was 65 in excess of the 1944-45 period.

Medical personnel of the Royal Navy have continued to use the library during their stay in this State.

The Association is pleased to record its appreciation of donations received from the following: The Editor, THE MEDICAL JOURNAL OF AUSTRALIA, New South Wales Post-Graduate Committee in Medicine, Royal College of Obstetricians and Gynæcologists, Royal Australasian College of Physicians, American Legation, Sydney, Walter and Eliza Hall Institute, National Health and Medical Research Council, Department of Labour and National Service, Allied Geographical Section, South-West Pacific Area, United States Office of War Information, New South Wales Schools for Deaf and Blind Children, School of Public Health and Tropical Medicine, United States Information Library, Linnean Society, Royal Hospital for Women, Royal Prince Alfred Hospital, Women's Hospital, Melbourne, Australian Institute of Anatomy, Wisconsin General Hospital, Rachel Forster Hospital, United States Department of Labour, Professor B. T. Mayes, Dr. E. P. Blashki, Dr. A. S. Boyd, Dr. K. S. M. Brown, Dr. D. G. Carruthers, Dr. G. S. Colvin, Dr. H. W. Conolly, Dr. C. E. Corlette, Dr. L. A. Dey, Dr. J. Goldman, Dr. G. C. Halliday, Dr. V. J. Kinsella, Dr. G. B. Lowe, Dr. J. K. Maddox, Dr. J. O'Brien, Mr. D. Stead, Dr. F. G. N. Stephens, Dr. E. A. Tivey, the Section of Radiology, the Section of Obstetrics and Gynæcology, the Section of Medicine, and the Section of Pathology and Bacteriology.

Affiliated Local Associations of Members.

Blue Mountains (affiliated 1944): *Chairman*, Dr. L. Bamber; *Honorary Secretary*, Dr. E. P. Dark. Membership, 15. Four meetings were held.

Border (affiliated 1908): *Chairman*, Dr. C. M. MacKnight; *Honorary Secretary*, Dr. L. S. Woods. Membership, 14. Two meetings were held.

Broken Hill (affiliated 1942): *Chairman*, Dr. W. E. George; *Honorary Secretary*, Dr. W. E. Boscence. Membership, 12. Fifteen meetings were held.

Canterbury-Bankstown (affiliated 1930): *Chairman*, Dr. R. Segal; *Honorary Secretary*, Dr. G. Russell..

ATTENDANCE AT COUNCIL AND STANDING COMMITTEE MEETINGS.

	Council.	Committees.					
		Executive and Finance.	Organization and Science.	Medical Politics.	Hospitals.	Ethics.	Medical Sociology and Research.
BARRON, G. M.	10	—	—	—	—	2	1
BELL, GEORGE	9	10	0	5	2	0	0
BLACKBURN, SIR CHARLES	8	—	—	—	—	2	—
BROWN, K. S. M.	9	—	—	—	—	—	1
COLLINS, A. J.	9	9	0	5	3	0	0
DAVIDSON, A. M.	8	7	—	—	—	—	0
DEY, L. A.	8	—	—	—	3	—	—
EDYE, B. T.	8	—	—	—	—	1	—
GRIEVE, H. R. R.	8	—	—	6	—	—	1
HALLIDAY, G. C.	10	—	3	9	0	—	—
HIPSLEY, P. L.	8	—	—	—	2	—	—
JAMIESON, H. HUNTER	7	—	—	10	—	—	—
MCINTOSH, A. M.[1]	7	6	—	—	—	—	—
MADDOX, J. K.[1]	6	11	2	—	—	—	—
PARKER, K. S.	10	—	—	10	3	—	—
SIMMONS, W. F.	9	11	—	9	—	—	—
THOMAS, A. C.	9	9	3	9	1	1	0
TIVEY, E. A.	10	11	1	8	3	2	1
WARD, H. K.	10	—	2	—	—	—	—
WILLCOCKS, G. C.	6	7	—	—	—	1	—
Meetings held	10	12	3	11	3	2	1

[1] Full-time active service.

Central Northern (affiliated 1910): *Chairman*, Dr. C. A. F. Clark; *Honorary Secretary*, Dr. O. J. Ellis. Membership, 58. Four meetings were held.

Central Southern (affiliated 1909): *Chairman*, Dr. H. R. Cope; *Honorary Secretary*, Dr. R. G. Woods. One meeting was held.

Central Western (affiliated 1910): *Chairman*, Dr. M. F. O'Reilly; *Honorary Secretary*, Dr. K. S. M. Brown. Membership, 41. Two meetings were held.

Eastern District (affiliated 1913): *Chairman*, Dr. F. O. Stokes; *Honorary Secretary*, Dr. N. E. McLaren. Membership, 14. One meeting was held.

Eastern Euburbs (affiliated 1911): *Chairman*, Dr. H. A. Ryan; *Honorary Secretary*, Dr. C. M. Burns. Membership, 96. Three meetings were held.

Far South Coast and Tablelands (affiliated 1935): *Chairman*, Dr. E. A. Marshman; *Honorary Secretary*, Dr. L. W. Wing. Membership, 10. Two meetings were held.

Illawarra Suburbs (affiliated 1913): *Chairman*, Dr. N. Rau; *Honorary Secretary*, Dr. G. W. Ashby. Membership, 48. Three meetings were held.

Kuring-gai District (affiliated 1929): *Chairman*, Dr. C. J. King; *Honorary Secretary*, Dr. J. Woolnough. Membership, 48. Four meetings were held.

North Eastern (affiliated 1913): *Chairman*, Dr. R. E. Longworth; *Honorary Secretary*, Dr. G. J. Rawle. Membership, 39. Three meetings were held.

Northern District (affiliated 1911): *Chairman*, Dr. R. B. Austin; *Honorary Secretary*, Dr. R. J. Jackson. Membership, 62. One meeting was held.

South Eastern (affiliated 1914): *Chairman*, Dr. A. L. Caselberg; *Honorary Secretary*, Dr. D. A. Britten.

Southern District (affiliated 1909): *Chairman*, Dr. N. F. Benjamin; *Honorary Secretary*, Dr. R. M. G. Holmes. Membership, 59. Three meetings were held.

South Sydney (affiliated 1909): *Chairman*, Dr. R. S. Scott; *Honorary Secretary*, Dr. C. H. Jaede. Membership, 27. Two meetings were held.

Warringah District (affiliated 1929): *Chairman*, Dr. J. F. S. Elphinstone; *Honorary Secretary*, Dr. E. L. Newman. Membership, 74. Three meetings were held.

Western (affiliated 1908): *Chairman*, Dr. S. L. Cameron; *Honorary Secretary*, Dr. S. R. Dawes. Membership, 64.

Western Suburbs (affiliated 1908): *Honorary Secretary*, Dr. R. J. J. Speight.

Annual Meeting of Delegates.

The thirty-second annual meeting of delegates of the affiliated local associations of members with the Council was held on Friday, September, 28, 1945.

The delegates present at the meeting were as follows: Blue Mountains, Dr. E. P. Dark; Canterbury-Bankstown, Dr. R. Segal; Central Northern, Dr. O. J. Ellis; Central Southern, Dr. F. J. McCarthy; Eastern Suburbs, Dr. C. M. Burns; Illawarra Suburbs, Dr. G. F. Elliott; Kuring-gai District, Dr. G. L. Howe; Northern District, Dr. A. G. Brydon; Southern District, Dr. N. F. Benjamin; South Eastern, Dr. A. L. Caselberg; South Sydney, Dr. C. H. Jaede; Warringah District, Dr. J. V. Mutton; Western Suburbs, Dr. T. Y. Nelson; Western, Dr. S. L. Cameron.

Special Groups for the Study of Special Branches of Medical Knowledge.

Anæsthesia (inaugurated 1934): *Chairman*, Dr. C. N. Paton; *Honorary Secretary*, Dr. A. Distin Morgan. Membership, 14. Five meetings were held.

Genito-Urinary and Venereal Diseases (inaugurated 1928).

Medical Literature and History (inaugurated 1925).

Medicine (inaugurated 1924): *Chairman*, Dr. L. H. Hughes; *Honorary Secretary*, Dr. F. A. E. Lawes. Membership, 35. Four meetings were held, two in conjunction with meetings of the Branch.

Neurology, Psychiatry and Neurosurgery (inaugurated 1924): *Chairman*, Professor W. K. Inglis; *Honorary Secretary*, Dr. C. Henry. Membership, 39. Eight meetings were held, two in conjunction with meetings of the Branch.

Obstetrics and Gynæcology (inaugurated 1925): *Chairman*, Dr. J. N. Chesterman, *Honorary Secretary*, Dr. F. N. Chenhall. Membership, 73. Five meetings were held, one in conjunction with a meeting of the Branch.

Orthopædic Group (inaugurated 1923): *Chairman*, Dr. W. N. Little; *Honorary Secretary*, Dr. C. C. McKellar. Membership, 16. Five meetings were held, one in conjunction with a meeting of the Branch.

Oto-Rhino-Laryngological Society of New South Wales (inaugurated 1924): *Chairman*, Dr. A. O. Davy; *Honorary Secretary*, Dr. G. C. Halliday. Membership, 36. Five meetings were held, one in conjunction with a meeting of the Branch.

Pædiatrics (inaugurated 1921): *Chairman*, Dr. C. C. P. Walker; *Honorary Secretary*, Dr. Kathleen Winning. Membership, 19. Six meetings were held, one in conjunction with a meeting of the Branch.

Pathology and Bacteriology (inaugurated 1924): *Honorary Secretary*, Dr. E. B. Jones.

Preventive Medicine (inaugurated 1922): *Honorary Secretary*, Dr. E. S. A. Meyers. Membership, 19. One meeting was held.

Radiology (inaugurated 1926): *Chairman*, Dr. A. T. Nisbet; *Honorary Secretary*, Dr. H. M. Cutler.

Resident Medical Officers' Special Group (inaugurated 1945): *Chairman*, Dr. R. H. Syred; Honorary Secretary, Dr. Stefania W. Siedlecky. Membership, 18. Six meetings were held, one in conjunction with a meeting of the Branch.

Sociological Medicine (inaugurated 1944): *Chairman*, Dr. D. J. Anderson; *Honorary Secretary*, Dr. L. E. Hewitt. Membership, 24. Five meetings were held, one in conjunction with a meeting of the Branch.

Surgery (inaugurated 1925). One meeting was held in conjunction with a meeting of the Branch.

Urology (inaugurated 1940): *Chairman*, Dr. J. W. S. Laidley; *Honorary Secretary*, Dr. M. S. S. Earlam. One meeting was held in conjunction with a meeting of the Branch.

The Federal Council of the British Medical Association in Australia.

The Federal Council of the British Medical Association in Australia met in Melbourne on October 15, 16, 17 and 18, 1945, and in Sydney on March 5, 6 and 7, 1946.

At these meetings the Branch was represented by Dr. A. J. Collins and Dr. W. F. Simmons.

Federal Council Organization Fund.

Approval was given by Council to the proposal for a Federal Organization Fund. The objects of this Fund were set out in a letter forwarded to all members of the Association.

Federal Medical War Relief Fund.

Dr. A. J. Collins, Dr. A. C. Thomas and Dr. A. M. Davidson have been appointed as members of the Local Committee of Management of the Federal Medical War Relief Fund.

Australasian Medical Publishing Company, Limited.

Dr. Lorimer Dods was appointed representative of the Association on the Australasian Medical Publishing Company, Limited, in succession to the late Dr. F. P. Sandes.

Constitution of Council.

At its meeting on September 8, 1944, the annual meeting of delegates of local associations recommended that consideration of the alteration of the constitution of Council should be deferred until after the war. Following the cessation of hostilities the matter was again discussed at the annual (1945) meeting of delegates of local associations held on September 28, 1945, and at a special meeting of Council with the delegates and representatives of special groups held on the same date. Both meetings recommended that the constitution of the Council be altered so as to provide for proportional representation and that a Committee be appointed to furnish a report.

Subsequently the Council appointed a Committee consisting of the President, President-Elect, Honorary Treasurer, Honorary Secretary, four representatives of Local Associations—two from country and two from metropolitan associations—and two representatives of Special Groups. The Committee held its first meeting on January 18, 1946.

Amendment of By-Laws.

At an extraordinary general meeting held on March 22, 1945, By-law 4 (a) was amended by the addition of the following words:

> Provided always that where a member is serving or has served with the Armed Forces of any part of the British Empire, the time during which he is serving or has served with such Forces shall not be taken into account when calculating the aforesaid period of three years.

Rehabilitation of Medical Officers of the Armed Forces.

A handbook, "Facts about Rehabilitation", has been prepared by the Association and the Post-Graduate Committee in Medicine of the University of Sydney. The handbook provides information for service and ex-service medical

officers in regard to such matters as facilities for training for demobilized medical officers, opportunities for training before discharge, post-graduate courses, placement in civil practice, and honorary hospital appointments.

Medical Benefits Fund of New South Wales.

At a special meeting of representatives of local associations and of special groups with the Council held on April 27, 1945, approval was given to the general principles underlying the proposed "Medical Benefits Fund of New South Wales", a plan for the prepayment of medical services by members of the public.

Council regrets that owing to legal difficulties in regard to incorporation, the introduction of the scheme has been delayed.

Comprehensive Pathological Services for New South Wales.

A plan for the establishment of comprehensive pathological services, prepared by the Section of Pathology and Bacteriology, was adopted with minor amendments by the Council and submitted to the Hospitals Commission.

The Commission advised Council that it appreciated the interest the Association was taking in the matter, that it had obtained the approval of the Minister for Health for the establishment of laboratories at a number of country hospitals, that the laboratories would be staffed by full-time salaried pathologists, and would be available to public, private and intermediate patients whether in-patients or out-patients, and that private and intermediate patients would be charged fees for the service, the fees being retained by the hospital.

As the Association is opposed to the socialization of medical services, deputations from the Council subsequently interviewed the Minister for Health and also the Chairman of the Hospitals Commission and asked that consideration be given to the employment of pathologists on a part-time salaried basis with right of private practice instead of on a full-time salaried basis.

The Minister for Health in reply advised that it was his considered opinion and that of the Hospitals Commission that the best service to the public would be given if the pathologist was on a full-time salary.

The matter is still under consideration by the Council.

X-Ray Services in North Coast Towns of New South Wales.

Representations were made to Council by the Chairman, Hospitals Benefit Association (North Coast Area), on behalf of a Committee of representatives of a number of hospitals in the North Coast towns of New South Wales for the appointment of a full-time salaried radiologist to service the hospitals concerned.

The Hospitals Commission of New South Wales was informed that the Council did not approve of such a proposal.

Chair of Child Health at the University of Sydney.

A recommendation was made to the Senate that it establish a Chair of Child Health at the University of Sydney.

Hospital Policy.

Following meetings of representatives of special groups and local associations with the Council and of representatives of the honorary medical staffs of public hospitals with the Council for the purpose of discussing the Commonwealth *Hospital Benefits Act* and its implications, the following resolutions were adopted by Council, namely,

1. That the Council is opposed to any policy which entails the cessation of classification of patients on the grounds that such a policy would conflict with the efficiency of the profession and with the public welfare.

2. That the Council is opposed to patients receiving treatment free of charge in public wards when they can afford to pay intermediate or private fees.

3. That the Council demand the retention of the system of classification of patients into public, intermediate and private.

4. That the Council is opposed to the acceptance of any payment to members of the profession for services rendered to patients classified as public ward patients.

5. That the Council adheres to the system of honorary service in public wards.

6. That the Council recommend to members of the profession that under no circumstances should they accept payment for services now rendered in an honorary capacity.

Pharmaceutical Benefits Act, 1944.

As the Acting Minister for Health informed the Federal Council at a conference in Melbourne on October, 16, 1945, that the Commonwealth Government was not prepared to meet the objections of the Federal Council to the *Pharmaceutical Benefits Act*, the Association's policy of non-cooperation with the Government remains unaltered.

Contract Practice.

The Federal Council was requested to expedite the bringing into being of the Federal Common Form of Agreement.

Coal Inquiry.

In view of the serious nature of the allegations in regard to certification by medical practitioners which were made by witnesses before the recent Coal Inquiry, the Council, holding that such allegations reflected on the honour of the medical profession, decided to brief counsel to appear before the inquiry.

Resident Medical Officers' Salaries.

Legal representation was provided by the Association on behalf of the resident medical officers of Sydney Hospital, Royal Prince Alfred Hospital, Royal Alexandra Hospital for Children, Royal North Shore Hospital, Prince Henry Hospital and Newcastle Hospital when an application was made to the Industrial Commission by the boards of these hospitals for permission to increase the salaries of their resident medical staffs.

The Industrial Commission granted a permit to increase the salaries of medical officers performing routine medical duties during the first year after graduation to £260 *per annum*, and of medical officers performing routine duties during their second year of graduation to £390 *per annum*.

A similar permit was granted Saint Vincent's Hospital, the Association again providing legal representation in this application.

In the case of Newcastle Hospital an extra allowance of £25 *per annum* for travelling expenses was granted and a permit given for the salaries of resident medical officers performing routine duties in the third year of graduation to £520 *per annum*.

The Association has approached the Hospitals Association of New South Wales, an industrial union of employers, representing the hospitals throughout the State with the exception of those above mentioned and a few others, with a view to its making an application to the Industrial Commission for permits to increase the salaries of medical officers of the hospitals which it represents.

Department of Medical Sociology and Research.

The work of the Department has been chiefly the continuation of three series of radio talks which are given through the National stations by the Association's spokesman.

These are the "Highways to Health" talks on medical and health subjects, the "Kitchen Front" daily talks on nutritional principles and food economy, and "The Care and Guidance of Children". Six articles were contributed to the "Health Week" booklet.

A new feature of the work has been the preparation, at the invitation of the Australian Broadcasting Commission, of talks in the form of a "news commentary", on a topical subject, by the Association's Spokesman after the 7 p.m. news. Talks have been given on the care of former prisoners-of-war, questions of food supply and nutrition in Britain, and research on the common cold.

On various occasions assistance was given to the Press, in the checking or preparation of articles on medical subjects, and to the Broadcasting Commission in checking material of a medical or sociological nature used in its programmes.

Recognition of Chiropodists.

A special committee of Council met representatives of various chiropodial organizations to consider a request by these bodies for the recognition of chiropodists.

Agreement having been reached on the question of the scope of chiropody, the Council decided to give official recognition to chiropodists provided that a competent

organization, on which the Association had adequate representation, was set up to deal with such matters as training, examinations, ethical standards, *et cetera*.

British Medical Agency of New South Wales, Limited.

The annual general meeting of the members of the British Medical Agency of New South Wales, Limited, was held on October 2, 1945.

The Chairman, Dr. A. M. Davidson, in presenting the report on the operations of the Company for the year ended June 30, 1945, stated that the difficulties of the war period had been overcome better than had been anticipated, and that the indications were that there would be continued increased activity now that the war had ended.

The profits showed an improvement on the previous year.

Medical Finance Limited.

The eighth Annual General Meeting of Medical Finance Limited was held on October 2, 1945.

The Chairman, Dr. A. M. Davidson, reported a small loss on the year's transactions due to difficulties created by war time conditions.

Premises Revenue Account.

The Premises Revenue Account discloses a net surplus of £1,271 as against a net surplus of £1,613 for the year ended December 31, 1944, thus shewing a decrease of £342 in the net surplus revenue earned. This decrease is accounted for by a net increase in income of £379 and a net increase in expenditure of £721.

The percentages of rent revenue, expenses and depreciation and the percentage of net surplus for the year to the capital value of the land and building (British Medical Association House) as shown by the books at December 31, 1945, namely £155,669, with the previous years' percentages in parentheses, are as follows:

Rent Revenue (including amount charged for British Medical Association Branch offices *et cetera*)		11·3%	(10·94%)
Sundry Expenses, Interest and Provision for Painting Building ..	8·8%		(8·16%)
Depreciation of Building	1·7%		(1·76%)
		10·5%	
		0·8%	(1·02%)

Financial Statement.

The Council has pleasure in presenting to members the balance sheet and accounts in respect of the financial year which terminated on December 31, 1945.

The net surplus of revenue over expenditure for the year amounted to £1,828 7s. 1d. after making provision for all known expenses.

The sum of £3,027 18s. 9d. has been written off for depreciation of the building (British Medical Association House), plant, office furniture and equipment, and the library.

A sum of £200 has been provided out of the current year's revenue to create a reserve for painting the exterior of the building. This amount for the time being is used in the business of the Association.

NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION.

Balance Sheet as at December 31, 1945.

	£ s. d.	£ s. d.
FIXED LIABILITIES.		
Debentures—		
86 4% Series "A" at £10 each ..	860 0 0	
360 4·65% Series "B" at £50 each ..	18,000 0 0	
211 4·65% Series "C" at £10 each ..	2,110 0 0	
	20,970 0 0	
Less Amount Unpaid	54 0 0	
	20,916 0 0	
Australian Mutual Provident Society (Secured by Mortgage over Property, British Medical Association House)	57,000 0 0	77,916 0 0
CURRENT LIABILITIES.		
Commercial Banking Co. of Sydney Ltd.—Overdraft Premises and Branch Current Accounts	406 8 11	
Sundry Creditors	330 1 10	
Interest Accrued on Mortgage	201 17 6	
Deposit on Call	700 0 0	1,638 8 3
OTHER CREDIT BALANCES.		
Subscriptions Paid in Advance	76 4 3	
Provision for Taxation	3,378 0 0	
Provision for Painting of Building ..	1,271 0 0	4,725 4 3
ACCUMULATED FUNDS.		
Balance at December 31, 1944	£1,821 1 4	
Add Surplus for year ended December 31, 1945—		
Premises Account £1,270 12 9		
Branch Account .. £557 14 4		
	1,828 7 1	
		83,649 8 5
		£167,929 0 11

	£ s. d.	£ s. d.
FIXED ASSETS.		
Land and Building, British Medical Association House—at Cost *less* Depreciation on Building	155,648 11 3	
Library at Valuation *less* Depreciation	1,992 11 6	
Office Furniture and Equipment—at Valuation *less* Depreciation ..	645 9 0	
Debentures in other Companies—		
Australasian Medical Publishing Company, Limited (Face Value)	100 0 0	
Commonwealth Treasury Bonds (Face Value)	7,000 0 0	165,386 11 9
FLOATING ASSETS.		
Sundry Debtors (after making provision for Doubtful Debts)—		
Sundry Tenants, Rent *et cetera*	1,868 5 1	
Cash on Hand	13 3 3	1,881 8 4
OTHER DEBIT BALANCES.		
Prepaid Insurance, Rates *et cetera*		661 0 10
		£167,929 0 11

Sydney, March 13, 1946.

E. A. TIVEY, President.
GEORGE BELL, Hon. Treasurer.
ROBT. J. STIFFE, Financial Secretary.

We have examined the foregoing Balance Sheet with the Books of Account of the New South Wales Branch of the British Medical Association, and, having obtained all the information and explanations we have required, we are of the opinion that such Balance Sheet is properly drawn up so as to exhibit a true and correct view of the state of the Company's affairs according to the best of our information and the explanations given to us and as shown by the Books of the Company. In our opinion the Register of Members and other records which the Company is required to keep by the New South Wales Companies Act, 1936, or by its Articles have been properly kept.

London Bank Chambers,
18-20 Martin Place, Sydney.

F. W. DURSBURY & Co.,
Chartered Accountants (Aust.).

BRANCH ACCOUNT.

Income and Expenditure Account for Year ended December 31, 1945.

	£	s.	d.	£	s.	d.
To Salaries	3,620	14	4			
„ Rent—Offices *et cetera*	1,000	0	0			
„ Printing and Stationery	345	19	8			
„ Stamps and Telegrams	401	18	8			
„ Telephones	147	16	8			
„ Code Address	2	4	6			
„ Travelling Expenses	200	16	9			
„ Insurance	7	0	8			
„ Exchange and Bank Charges	8	12	9			
„ Refreshments—Meetings	6	0	0			
„ Newspapers	7	13	6			
„ Sundry Petty Expenses	54	3	10			
„ Tea Money	52	0	3			
„ Federal Council	1,658	5	0			
„ Legal Expenses	99	3	0			
„ Pay Roll Tax	78	1	3			
				7,690	10	10
„ Depreciation—						
Library	172	6	9			
Office Furniture and Equipment	51	18	8			
				224	5	5
„ Balance, being Surplus for the year ended December 31, 1945, transferred to Accumulated Funds Account				557	14	4
				£8,472	10	7

	£	s.	d.	£	s.	d.
By Subscriptions Received—						
1945	12,532	4	8			
1944	213	13	6			
Previous Years	54	1	6			
				12,799	19	8
Less Proportion due to—						
British Medical Association	2,983	16	3			
THE MEDICAL JOURNAL OF AUSTRALIA	1,985	7	6			
				4,969	3	9
				7,830	15	11
„ Interest	200	12	8			
„ Rent—Assembly Hall	114	19	0			
„ Broadcasting Fees	318	3	0			
„ Donations	3	3	0			
„ Sales—C.F.A. *et cetera*	4	17	0			
				641	14	8
				£8,472	10	7

Dr. George Bell moved that the balance sheet, the statement of receipts and expenditure and the premises account be received. The motion was seconded by Dr. B. T. Edye. Dr. Edye also seconded Dr. Bell's motion that the statements be adopted. Both motions were carried.

ELECTION OF OFFICE-BEARERS.

Dr. E. A. Tivey announced that the following had been elected members of the Council for the ensuing year: Dr. George Bell, Sir Charles Blackburn, Dr. K. S. Macarthur Brown, Dr. A. J. Collins, Dr. A. M. Davidson, Dr. L. A. Dey, Dr. B. T. Edye, Dr. H. R. R. Grieve, Dr. G. C. Halliday, Dr. R. H. Macdonald, Colonel A. M. McIntosh, Dr. J. K. Maddox, Dr. I. D. Miller, Dr. A. J. Murray, Dr. K. B. Noad, Dr. W. F. Simmons, Dr. G. G. L. Stenning, Dr. G. C. Willcocks.

Messrs. F. W. Duesbury and Company were appointed auditors for the coming year.

INCOMING PRESIDENT'S ADDRESS.

Dr. A. C. Thomas delivered his address (see page 573). At the conclusion of the address Dr. R. H. Macdonald moved a vote of thanks to Dr. Thomas for his address. Dr. I. D. Miller seconded the vote of thanks which was carried by acclamation.

INDUCTION OF PRESIDENT.

Dr. E. A. Tivey inducted the President for the year 1946-1947 (Dr. A. C. Thomas). Dr. Thomas thanked the members for his election.

NOTICE.

THE General Secretary of the Federal Council of the British Medical Association in Australia has announced that the following medical practitioners have been released from full-time duty with His Majesty's Forces and have resumed civil practice as from the dates mentioned:

Dr. P. L. Jobson, 185, Macquarie Street, Sydney (April 8, 1946).

Dr. N. H. W. Saxby, 71, Gray Street, Kogarah, New South Wales (April 1, 1946).

Dr. D. G. Hamilton, 13, Bridge Street, Epping, and 135, Macquarie Street, Sydney (April 8, 1946).

Special Correspondence.

LONDON LETTER.

FROM OUR REPRESENTATIVE IN BRITAIN.

PREVENTIVE MEDICINE, positive health and psychology are so much in the written and spoken word nowadays, that it is not easy to find any pressing problem without a medical aspect. One of the most popular hits in a recent muscial comedy was a song entitled: "Shopping, Eating and the Nine O'Clock News." With the cessation of active operations, the present state of affairs hardly warrants the title of "peace"; the evening broadcast has lost much of its appeal, but rations and how to obtain them are still to the fore. In the official view the distributive trade, as being non-productive, has a low priority, and so the shortage of man-power in most shops is still acute. This helps to perpetuate the queue system, particularly in the cities and big towns, though it is less noticeable in the country. A recent issue of *Punch* shows an earnest-looking man holding his watch in his hand and announcing proudly but sadly to his fellow sufferers that: "In another two minutes I shall have spent exactly six months in queues."

The paucity of near essential non-rationed goods is another thorn in the side of the long-suffering housewife, but a slow, if irregular, improvement can be seen if a comparison is made over a period of months. Though supplies are small and quickly snapped up, the previous absence of many items is replaced now by a small, irregular trickle, which is gaining volume, albeit slowly. Medical supplies share in this advance; but many items, particularly instruments, are still in short supply and may take weeks or even months to obtain. White coats are supplied in order of application, and take time to materialize; personal experience suggests that milkmen have better priority than doctors.

There is much diversity of opinion over the quality and quantity of the rationed food. Dietitians, scientists and statisticians regard the ration as adequate to maintain health; but a somewhat different view is taken by many doctors and welfare workers, who are in closer touch with the consumers. Difficulties of distribution often mean a difference between what is intended and what really is, and the margin of safety is so small as not to allow of any shortcomings or loss. General practitioners notice that colds are more frequent and take longer to clear, while minor ailments assume an importance not seen in pre-war days. There was some uneasiness in the early part of the year at the weekly rise in deaths from influenzal pneumonia. The highest figure for London and the great towns was 304 for the week ending February 9, 1946, but the steady fall to 93 for the week ending March 16, 1946, is reassuring. There is no doubt that the feeding of the young during the war years has been a success, though some of this is probably due to self-denial on the part of their parents. The following table, which covers some 350,000 children, gives the number of localities where weight-growth rates were better than, worse than or the same as in pre-war years:

	Better.	Worse.	Same.
Boys (height)	17	1	3
Girls (height)	14	2	4
Boys (weight)	19	2	–
Girls (weight)	20	1	–

Strangely enough, the increase was greater in children living at home than in those accommodated in camp schools, despite all efforts to improve living conditions in these schools. Among some groups of adults it is found that workers prefer to have their food cooked for them by their wives, rather than to have it served from a communal

kitchen. In this, as in many other ways, the Briton shows that in his opinion there is "no place like home".

Though now on the upgrade, coal production has been a black spot for many months, and the miners claim that an increased ration, cooked at home, would mean a bigger coal output. In support of this view it is pointed out that when the daily ration of the Ruhr miners was cut from 3,400 to 2,800 Calories, the coal produced fell by over 10%—how much this was due to psychological causes is not clear. It is an anomaly that a girl typist in the services gets a more generous ration than a miner on the coal face in Britain.

Before and after Christmas official announcements led people to believe that, notwithstanding a general world food shortage, the worst of the restrictions was over, some improvement was promised, and everyone felt happy. The Minister of Food was guilty of an error in tactics when he announced casually one night that dried egg powder was to be reduced and perhaps cut off entirely to save dollar exchange. When first introduced this food was unpopular, but had become much appreciated as a breakfast dish and to help in the feeding of children. The news of its possible abolition caused a storm among those who had to run households, and reduction in the import of American films and tobacco were urged as better ways to meet the situation. Within a week orders went out to cut the fat ration and to raise the extraction rate of bread to 85%, and people became angry and apprehensive. The 85% bread is quite palatable, but it means a reduction in the feeding stuff for pigs, dairy animals and fowls, which will lead to repercussions later. Despite the fact that nearly a million tons of food have been imported to Germany since mid-June last year to feed Germans in the British zone, the civilian ration in the zone has been dropped from 1,500 to 1,000 Calories, and the fear of local riots has led to a strong protest being made by those in charge. The Americans have also reduced the civilian ration in their zone.

These reductions have followed on the Indian drought, which raised the country's demand for wheat from 400,000 to over 2,000,000 tons, thus upsetting the delicate calculations that had been made to carry everyone on over the next few months. The circulation of contradictory orders, which still continues, suggests poor team work in top government circles, and the present Minister of Food is not so good a psychologist as his predecessors. The end result is a feeling of frustration and annoyance in the people as a whole. Suggestions to meet the situation are (*a*) a further small reduction in the British ration, (*b*) raising the extraction rate of bread still higher, (*c*) brewing less beer and (*d*) reducing the manufacture of biscuits and cakes.

Amid a mass of conflicting figures and statements, the man in the street has difficulty in coming to a reasoned conclusion, but while the present position is serious, it does not appear to be dangerous, apart from possible implications not yet apparent, though the margin of safety is perilously small. One comforting thought is that, on the law of averages, we should have had our full share of food disasters; one incalculable factor remains, however—the weather.

The one bright spot has been the magnificant response made by more favourably situated countries within the Empire, notably Australia. A leading evening paper had a caption across its front page: "Australia to the Rescue." What you have done and are doing is greatly appreciated here, and the news of the recent abundant rain got a good Press, not merely from a selfish standpoint, but because people were glad to know that the helpers were being helped in their turn.

The rate of demobilization has attracted less attention in the daily Press lately, but it is a subject that may come to the fore again at any moment. It is estimated that there will be still two million men and women in the services by June and 1,100,000 by December this year. In addition, not less than one and a half million are still employed on what is loosely called "munitions and equipment". The effect of this on the manpower available for civilian needs requires no stressing. Medical demobilization goes fairly smoothly, though the Royal Air Force is often under fire, on the grounds that their doctors are held longer than is needful. The fear of possible epidemics during the past winter accelerated release of doctors towards the end of last year, but this has now slowed down. In all services general duty officers are being released earlier than specialists in corresponding groups. This is partly due to the fact that many of the senior specialists were released early owing to age and hospital needs, particularly the needs of the teaching hospitals. Difficulty is being found in replacements, and commissions have been offered for definite periods, eighteen or twenty-four months, with release guaranteed at the end of that time, to attract suitable volunteers; so far the response has been disappointing. Some 400 doctors working in the Emergency Medical Services, which catered for both service and civilian cases, are due for release by the end of April, but even then some 900 full-time medical men will still be employed by the Ministry of Health under the Emergency Medical Services scheme, mainly in civilian hospitals where service patients are still under treatment.

Shortage of manpower is a difficulty in all walks of life. In addition to those people still serving and on "munitions", quite a number of released personnel are not returning to their pre-war jobs; they are either training for new ones or are trying to follow up the line of work learnt while serving; thus a bank clerk who made a success of radar is now wishful to get a place in an electrical firm. The "last in, last out" principle means that many key men are not available at a time when the men who used to work under them may have been released. The "B" class (key man) release under certain conditions regarding pay and direction of labour is not popular, and in many trades has not been availed of up to the 10% laid down. When men do get out of the services, they want to get out for good and without any strings attached to them.

All this leads to many queer and retardatory gaps in the production line. Up to July last, 48,000 applications for assistance in divorce proceedings had been accepted by the legal aid sections of the services, and at the present rate of disposal it will take some fifteen years to clear them all off. The main delay is in the preparation of the cases, and here the greatest need is for some 300 typists to do the clerical work in the special offices which have been, or are to be, opened to expedite procedure.

Shortage of domestic staff is an urgent problem the hospitals have to face. One large teaching hospital in London employs women prisoners, and in other cases whole wards and in one or two cases whole hospitals have had to be closed down. One block of 300 beds had to close when the stoker, who attended to the hot-water system, fell ill. In this connexion wages were the great stumbling block, and a national minimum wage has been agreed on between hospital authorities and trades unions for some 80,000 workers in all types of hospitals. In addition to better pay, workers will have twelve days' leave annually after a year's service, the usual bank holidays, free uniform, and overtime rates of pay over forty-eight hours. Some of the new rates of pay are set out hereunder:

	Resident (Per Week).	Non-Resident (Per Week).
Cooks	53s. or 59s.	76s. or 82s.
Assistant cooks	47s. or 53s.	70s. or 76s.
Ward orderlies, needlewomen *et cetera*	47s.	70s.
Certain special maids	45s.	68s.
General maids	41s.	64s.

Some of the new national minimum rates for men aged twenty-one and over are:

	Resident.	Non-Resident.
Ambulance driver	73s.	96s.
Steam stoker, gate porter	71s.	94s.
Ward orderly	69s.	92s.
General porter	63s.	86s.

A new quarterly journal is announced with the title of *Anæsthesia*. Dr. C. Langton Hewer is editor, and the periodical is issued under the auspices of the Association of Anæsthetists of Great Britain and Ireland. The editorial offices are c.o. George Pulman and Sons, Limited, Thayer Street, London, W.1.

CANADIAN LETTER.

By OUR SPECIAL CORRESPONDENT.

THE two main topics of discussion in medical circles in Canada this spring are (*a*) the plans for prepaid medical care outlined by President Truman in his speech to Congress, and (*b*) the recently announced plans of the British Government for medical care and nationalization of hospitals. It seems certain that public opinion in Canada will force our nine provinces to cooperate in the Federal Government's plans for national health insurance. Already the Province

of Saskatchewan is well on the way to such coverage of its 850,000 citizens, having established a year ago free medical care for all suffering from tuberculosis or cancer, all old-age pensioners, the blind, and all mothers' allowance cases, together with the dependants in such cases. Within the past month a *Hospitalization Act* has been passed by the Saskatchewan Legislature, giving free hospital care to anyone resident in the province for six months or more. Each resident will pay $5.00 per year, with a maximum cost of $30.00 per family. The passage of this act will further stabilize the financial position of existing hospitals and will enable health districts without adequate hospitals to provide the type most suited to rural needs. With the recent development in air ambulance service, whereby a doctor in any part of the province may call a plane for $25.00, this prairie province is taking the lead in implementing some of the long overdue health measures in Canada.

The comparatively new Department of National Health and Welfare has recently entered the motion picture field, and in collaboration with the National Film Board is placing excellent cinema material before the public. Two venereal disease films made by the Royal Canadian Air Force have been reedited for showing before high school age groups.

A recent follow-up study has been made on the work of the Alberta Eugenics Board, which in 1928 was constituted to administer the *Sexual Sterilization Act* by which mental defectives would be, and mentally ill persons could be, sterilized prior to discharge from a mental hospital. Up to the end of 1943 a total of 1,920 cases came before the Board, which approved operations in 917 instances.

Manitoba has recently passed a "licensing act" for "practical nurses" (as distinct from registered nurses who graduate after a three-year hospital course). The minimum rates of pay are $3.60 for an eight-hour day, or $5.00 for a 24-hour day where the nurse sleeps in the home and is on call.

At the moment Canada is exposed through the radio and Press to the bitter controversy now developing in the United States concerning President Truman's proposed health bill. The spearhead of the opposition to it is provided by the American Medical Association and its satellites, who assure the country that American medicine is the finest in the world and that Americans were never better cared for. President Truman has been at pains to tell the American people what this implies. Up to April 1, 1945, five million males called for military service between the ages of 18 and 37 years of age were classified as unfit. In other words, 30% of America's youth (for the same proportion was found in young women) were unfit for service. The President also told Congress that in 1,200 counties (40% of the total in the United States of America with a population of 15,000,000) there was no local hospital or none meeting the standards set by the national professional associations now belabouring the advocates of health insurance. Despite a most objective review of the health situation by President Truman, the American Medical Association has said editorially that "sickness insurance is the first step toward regimentation . . . that led to totalitarianism in Germany and the downfall of the nation".

Naval, Military and Air Force.

APPOINTMENTS.

The undermentioned appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Number 53, of March 21, 1946.

Citizen Naval Forces of the Commonwealth.

Royal Australian Naval Reserve.

Promotion.—Surgeon Lieutenant John Patrick Millar is promoted to the rank of Surgeon Lieutenant-Commander, dated 16th September, 1945.

Australian Military Forces.

Australian Army Medical Corps.

VX114275 Lieutenant-Colonel (Temporary Colonel) J. J. Black, D.S.O., V.D., relinquishes command of 118th Australian General Hospital (Australian Imperial Force) and is appointed to command 130th Australian General Hospital, 12th November, 1945.

VX12974 Lieutenant-Colonel (Temporary Colonel) J. M. Blair relinquishes command of 2nd/2nd Australian General Hospital and is appointed to command No. 115 (Heidelberg) Military Hospital, 14th December, 1945.

QX6437 Lieutenant-Colonel (Temporary Colonel) A. W. L. Row relinquishes command of 103rd Australian General Hospital, and is appointed to command No. 112 (Brisbane) Military Hospital, 14th December, 1945.

SX21586 Lieutenant-Colonel C. B. Sangster is appointed to command 121st Australian General Hospital (Australian Imperial Force), 11th December, 1945.

QX44608 Lieutenant-Colonel D. F. Miller is appointed to command No. 102 (Holland Park) Military Hospital, 3rd January, 1946.

QX6493 Lieutenant-Colonel (Temporary Colonel) F. G. Scoles, E.D., relinquishes command of No. 102 (Holland Park) Military Hospital, and is placed upon the Regimental Supernumerary List, 3rd January, 1946.

SX1433 Lieutenant-Colonel D. W. Brummitt relinquishes command of 15th Australian Field Ambulance and is placed upon the Regimental Supernumerary List, 21st December, 1945.

VX117117 Lieutenant-Colonel Sir H. G. Smith, V.D., relinquishes command of 107th Australian Convalescent Depot and is placed upon the Regimental Supernumerary List, 9th January, 1946.

VX14686 Lieutenant-Colonel (Temporary Colonel) D. J. Thomas relinquishes command of No. 115 (Heidelberg) Military Hospital and is placed upon the Regimental Supernumerary List, 14th December, 1945.

QX6005 Lieutenant-Colonel (Temporary Colonel) T. A. Parry relinquishes command of No. 112 (Brisbane) Military Hospital and is placed upon the Regimental Supernumerary List, 14th December, 1945.

NX133935 Lieutenant-Colonel J. McD. Mack relinquishes command of 121st Australian General Hospital (Australian Imperial Force), and is placed upon the Regimental Supernumerary List, 11th December, 1945.

The following officers are placed upon the Regimental Supernumerary List: Lieutenant-Colonels VX222 L. E. Rothstadt and SX2932 M. T. Cockburn, 4th December, 1945, WX33954 Major (Temporary Lieutenant-Colonel) C. Fortune and Lieutenant-Colonels QX22478 E. A. F. McDonald, 21st December, 1945, and NX70268 H. I. Turnbull and QX6440 J. M. Yeates, 7th January, 1946.

VX14845 Lieutenant-Colonel N. M. Edie is transferred from the Permanent Supernumerary List (Australian Army Medical Corps), 3rd January, 1946.

NX212 Colonel (Temporary Brigadier) J. Steigrad, C.B.E., E.D., relinquishes the rank of Temporary Brigadier and is transferred to the Reserve of Officers (Australian Army Medical Corps) with the rank of Colonel and is granted the rank of Honorary Brigadier, 18th December, 1945.

NX70330 Lieutenant-Colonel (Temporary Colonel) A. J. Murray, O.B.E., relinquishes the rank of Temporary Colonel and is transferred to the Reserve of Officers (Australian Army Medical Corps) with the rank of Lieutenant-Colonel and is granted the rank of Honorary Colonel, 14th December, 1945.

WX3325 Lieutenant-Colonel (Temporary Colonel) F. K. Wallace, O.B.E., relinquishes the rank of Temporary Colonel and is transferred to the Reserve of Officers (Australian Army Medical Corps) with the rank of Lieutenant-Colonel and is granted the rank of Honorary Colonel, 14th December, 1945.

The following officers are transferred to the Reserve of Officers (Australian Army Medical Corps): Lieutenant-Colonels VX38655 M. L. Powell, 14th December, 1945, SX1464 R. G. Champion de Crespigny, 20th December, 1945, VX14782 T. U. Ley and SX10686 A. D. Lamphee, 21st December, 1945, VX14850 T. H. Ackland, 3rd January, 1946, SX2912 A. H. Lendon, 4th January, 1946, and NX70276 W. L. Macdonald, 7th December, 1945.

VX224 Lieutenant-Colonel (Temporary Colonel) M. A. Rees relinquishes the rank of Temporary Colonel and is placed upon the Retired List, 18th December, 1945.

To be Lieutenant-Colonels, 27th September, 1945.—Majors (Temporary Lieutenant-Colonels) QX22478 E. A. F. McDonald, NX70268 H. I. Turnbull, QX6440 J. M. Yeates and NX70276 W. L. Macdonald.

109th Australian Casualty Clearing Station (Australian Imperial Force).—VX138744 Major G. G. Godfrey is removed from the Regimental Supernumerary List, 8th January, 1946.

Inter-Service Medical Wing Demobilization Centres (Australian Military Forces Component).—The following officers are transferred from Australian Army Medical Corps (Medical) Reinforcements with regimental seniority as from date of transfer, 5th November, 1945: Captains NX208035 I. F. Potts, NX208037 F. C. Byrnes, NX208038 J. M. L'Estrange, NX208046 G. R. Terry, VX98456 D. J. Rae and NX208039 D. J. Stanger.

NX70413 Lieutenant-Colonel (Temporary Colonel) N. D Barton, C.B.E., E.D., from Acting Deputy Director-General

of Medical Services, Headquarters, Morotai Force, is appointed Deputy Director of Medical Services, Headquarters, Morotai Force, 4th January, 1946.

VX14380 Lieutenant-Colonel (Temporary Colonel) C. W. B. Littlejohn, O.B.E., M.C., from Consultant Surgeon, Headquarters, Morotai Force, is appointed Consultant Surgeon, "A" Branch, Headquarters, Australian Military Forces, 4th January, 1946.

VX114275 Lieutenant-Colonel (Temporary Colonel) J. J. Black, D.S.O., V.D., relinquishes command of 130th Australian General Hospital, and is appointed to command 2nd/2nd Australian General Hospital, 14th January, 1946.

NX139073 Lieutenant-Colonel (Temporary Colonel) J. Leah, C.B.E., relinquishes command of 2nd/9th Australian General Hospital, and is appointed to command 2nd/11th Australian General Hospital, 14th January, 1946.

VX81101 Lieutenant-Colonel (Temporary Colonel) G. A. Penington, E.D., relinquishes command of No. 114 (Goulburn) Military Hospital, and is appointed to command 118th Australian General Hospital, 9th January, 1946.

NX453 Lieutenant-Colonel (Temporary Colonel) J. S. Crakanthorp relinquishes command of 2nd/11th Australian General Hospital, and is placed upon the Regimental Supernumerary List, 14th January, 1946.

VX230 Lieutenant-Colonel (Temporary Colonel) E. V. Keogh, D.C.M., M.M., relinquishes the appointment of Assistant Director-General of Medical Services, Australian Military Mission, Washington, and is placed upon the Regimental Supernumerary List, 12th December, 1945.

SX4120 Lieutenant-Colonel N. J. Bonnin and VX93665 Captain J. O. S. Gooden are placed upon the Regimental Supernumerary List, 17th January, 1946, and 15th December, 1945, respectively.

VX39173 Colonel (Temporary Brigadier) W. A. Hailes, C.B.E., D.S.O., relinquishes the rank of Temporary Brigadier, and is transferred to the Reserve of Officers (Australian Army Medical Corps), with the rank of Colonel, and is granted the rank of Honorary Brigadier, 4th January, 1946.

The following officers relinquish the rank of Temporary Colonel, and are transferred to the Reserve of Officers (Australian Army Medical Corps), with the rank of Lieutenant-Colonel, and are granted the rank of Honorary Colonel: Lieutenant-Colonels (Temporary Colonels) NX186 N. H. W. Saxby, O.B.E., 5th January, 1946, NX454 A. F. Hobson, O.B.E., 8th January, 1946, SX2843 J. M. Dwyer, 4th January, 1946, and NX29 R. V. Graham, 8th January, 1946.

The following officers are transferred to the Reserve of Officers (Australian Army Medical Corps): NX214 Major E. A. Hedberg, 21st October, 1945, Lieutenant-Colonels NX181 G. N. Young, 14th December, 1945, SX2932 M. T. Cockburn, 4th January, 1946, SX1459 E. P. Cherry and QX6481 R. G. Quinn, 8th January, 1946, WX1523 A. E. Vivian, 30th November, 1945, VX38892 G. N. Morris, 5th January, 1946, and SX11529 W. A. Russell, 8th January, 1946.

To be Temporary Lieutenant-Colonel, 17th January, 1946.—VFX81148 Major Lady W. I. E. MacKenzie.

To be Lieutenant-Colonels, 27th September, 1945.—Majors (Temporary Lieutenant-Colonels) SX11529 W. A. Russell and SX4120 N. J. Bonnin.

Reserve of Officers.

Australian Army Medical Corps.

The undermentioned officers are transferred to the Reserve of Officers with effect from the dates shown and, where applicable, cease to be seconded on the date prior to such transfer. Officers holding temporary rank relinquish such temporary rank on the date of transfer to the Reserve of Officers.

VX48422 Major P. G. Hayes, 6th December, 1945, and VX149828 Captain J. Stewart, 20th November, 1945.

103rd Australian Convalescent Depot.—SX1462 Major K. H. Heard, 8th November, 1945.

2nd/3rd Australian Casualty Clearing Station.—QX6288 Major E. P. Row, 11th December, 1945.

10¼th Australian Casualty Clearing Station (Australian Imperial Force).—TX2027 Major P. Braithwaite, 17th November, 1945.

3rd Australian Facio-Maxillary Plastic Surgery Unit.—NX213 Major P. H. Macindoe, 20th November, 1945.

CASUALTIES.

ACCORDING to the casualty lists received on April 18, 1946, Captain S. B. McK. White, of Neutral Bay, previously reported as "missing, believed deceased whilst prisoner of war", is now reported "presumed dead".

Correspondence.

"NON-TAKE" SPINAL ANALGESIA.

SIR: In a practical and lucid paper on "Spinal Analgesia" which appeared in your issue of March 30, 1946, Major Oldham refers to the bogy of "non-take", but dismisses it perhaps a trifle briefly. The fact remains that some anæsthetists whose lumbar puncture technique is above reproach, who make a point of aspirating cerebro-spinal fluid into the syringe before injecting the anæsthetic agent, are still bothered from time to time by this irritating event. The proferred explanation, that the bevel of the needle is not entirely within the subarachnoid space, undoubtedly may account for failure at times, but is not always convincing.

I should like to mention two factors which, to my knowledge, have not received much publicity. The first is that "non-take", when it occurs, is associated usually if not always with high spinal or mid spinal analgesia, whilst low spinal analgesia rarely if ever fails. The second is that the anæsthetist who has his failures is usually one who prefers to have the patient sitting up for lumbar puncture and injection of the solution ("heavy" "Nupercaine"), then postures him immediately afterwards. These are impressions gained from personal observation, and can surely be confirmed or refuted by anæsthetists from their case records. The conclusions to be drawn from such observations are clear enough. If lumbar puncture is performed in exactly the same manner for low, mid and high spinal analgesia, it is hardly fair to attribute the preponderance of "non-takes" in the last two to faulty insertion of the needle, and the cause must be sought elsewhere.

Anyone who cares to inject a coloured solution of "heavy" "Nupercaine" (specific gravity 1·024) into cerebro-spinal fluid *in vitro* cannot but be impressed by the rapidity with which it sinks to form a discrete layer at the bottom of the tube. "Heavy" "Nupercaine" injected by the lumbar route into a sitting patient must likewise gravitate speedily toward the sacrum. If the anæsthetist desires high spinal or mid spinal analgesia there is not a moment to be lost. Injection of the solution, withdrawal of the needle, posturing of the patient and thorough obliteration of lumbar lordosis by hyperflexing the thighs and tilting the sacrum, all must be done as quickly as possible. Otherwise a pool of "Nupercaine" remains below the promontory of the sacrum, where it is "fixed" a good deal more rapidly than most people realize. Perhaps it is even wiser to do as Major Oldham does—employ the lateral position for lumbar puncture whenever high or mid spinal analgesia is desired.

Yours, etc.,

PETER GILL.

Chatswood,
New South Wales,
March 3, 1946.

TOO MANY DOCTORS?

SIR: In the Melbourne *Argus* of April 1, 1946, there appeared a statement said to have been made by Dr. J. G. Hunter in his capacity of Secretary of the New South Wales Branch of the British Medical Association. The statement was to the effect that "restriction of entry of students to the faculty of medicine at the Sydney University appeared to be the only way to avoid what might be a serious surplus of doctors", and it appeared under the headline: "N.S.W. May Have Too Many Doctors."

Which prompts one to ask: Too many for what? Too many doctors to look after the public? Or too many doctors to be properly maintained from the available pool of fees?

A large increase in the number of practising medical men and women was forecast by the Medical Survey Committee in its report in 1943. It estimated then a probable increase in total numbers of approximately 800, or about 13%. My personal opinion has always been that that estimate was too low. The remedy suggested in the Medical Survey Committee's report was not the limiting of entry into the profession, but that "unless there is undertaken a definite organization of the distribution of medical services, a confused situation may arise which will be detrimental to the quality of the service rendered to the public".

No one would be justified in limiting the numbers of the profession simply to keep up the incomes of its individual members. The only moral justification for such a step would be that all possible methods of applying medical science to the total needs, collective and individual, of the population had been fully met, so that any more doctors would be actually surplus to all reasonable needs.

Does anyone claim that that position has arisen, or that it is likely to arise in the immediate future? In various country centres in the Commonwealth the numbers of the population served by a single doctor vary to my own knowledge between 5,000 and 500 or less. No one has yet arrived at a final decision as to the optimum number that should be so served; and no one has even attempted to find out how that optimum number would be affected on the one hand by a more efficient organization of practices and hospitals and on the other by extensions of the service given, in the direction of more preventive health measures, more effective clinical research or better organized and distributed pathological and radiological facilities. No one has yet seriously considered the optimum staffing of hospitals in the cities apart from financial considerations.

The statement attributed to Dr. Hunter must therefore be challenged. Arbitrary restriction of the right of entry into the profession is not the only way, nor the best way, nor the right way to meet the case, until the organization of distribution advised by the Medical Survey Committee has shown that any surplus of doctors which may then exist is really a surplus to actual requirements, and not merely a condition making for increased and undue competition among doctors to the extent of lowering their standards of living. That the latter condition would be "detrimental to the quality of the service rendered to the public" is unquestionable. But to deal with it at the present stage by a purely arbitrary restriction of the numbers of doctors allowed to practise would seem to be a very negative and non-constructive method.

Yours, etc.,

ARTHUR BROWN.

Colac,
Victoria,
April 2, 1946.

"ATEBRIN" AND DERMATITIS: AN INQUIRY.

SIR: It would be interesting to know if there have been many cases of dermatitis of a papular and vesicular type followed by scaling and accompanied by pruritus and drying of the skin and vasomotor instability shown by periodic flushing of the face following and attributable to "Atebrin" or any of the newer remedies for malaria. Perhaps a dermatologist could enlighten one on this point.

Yours, etc.,

"INQUIRER".

April 12, 1946.

Post-Graduate Work.

PROGRAMME OF COURSES IN SYDNEY FOR 1946.

THE New South Wales Post-Graduate Committee in Medicine has announced the following programme of courses for 1946:

April 23.—Surgery (course for general practitioners).
May 6.—Gynæcology (course for general practitioners).
May 13.—Obstetrics (course for general practitioners).
May 22.—Film afternoon.
June 27.—Pædiatrics (ten days).
June 1.—Course in advanced medicine suitable for candidates for the M.R.A.C.P. (ten weeks).
June 8.—Week-end course at Armidale.
June.—Course in gynæcology and obstetrics at King George V Memorial Hospital (two weeks).
June 19.—Film afternoon.
June 24.—Course for general practitioners (ten weeks).
July-August.—Winter lectures (eight).
July 17.—Film afternoon.
July 29.—Advanced course in surgery suitable for candidates for M.S. Part I and F.R.A.C.S.
August 3.—Week-end course at Lismore.
August 21.—Film afternoon.
September 9.—Course in obstetrics and gynæcology at King George V Memorial Hospital.
September 16.—Courses for candidates for M.S. Part I and Part I of D.L.O., D.G.O., and D.O. begin.
September 16.—Course for general practitioners (ten weeks, tentative).
September 18.—Film afternoon.
October 23.—Film afternoon.
November 19.—Week-end course at Parramatta.
November 20.—Film afternoon.
November 26.—Week-end course at Newcastle.
December 11.—Film afternoon.

In addition, instruction is arranged as follows: Obstetrics. Residence or attendance at the Women's Hospital, Crown Street, or the Royal Hospital for Women. Pædiatrics. Attendance at the Royal Alexandra Hospital for Children. Other subjects. Attendance at hospitals and special programmes are arranged for individual applicants. Instruction in the subjects of anatomy and physiology can be arranged.

Fees. For full-time courses £2 12s. 6d. per week; special fees are payable for other courses. These courses are open to all medical practitioners.

Reconstruction Training.—Handbooks can be obtained on application. Interstate applicants should apply first to their local Reconstruction Training Committee. For all further information communicate with the Post-Graduate Committee in Medicine, 131, Macquarie Street, Sydney, BW 7483, B 4606.

Nominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Spencer, Herbert Cyril, M.B., B.S., 1938 (Univ. Sydney), 61, Ashley Street, Chatswood.
Delohery, Henry James, M.B., B.S., 1939 (Univ. Sydney), 52, Woolwich Road, Hunters Hill.

The undermentioned have applied for election as members of the Tasmanian Branch of the British Medical Association:

Walker, Trevor Harcourt, M.B., B.S., 1941 (Univ. Sydney), Ulverstone, Tasmania.
Green, Brian Geoffrey, M.B., 1944 (Univ. Sydney), Whitemark, Flinders Island, Tasmania.

The undermentioned have been elected as members of the New South Wales Branch of the British Medical Association:

Elphinstone, Keith Raymond, M.B., B.S., 1945 (Univ. Sydney), 31, Prospect Road, Summer Hill.
Gibson, Charles John Harte, M.B., B.S., 1935 (Univ. Sydney), 2A, Henson Street, Summer Hill.
Gurney, Guy Stephen, M.B., B.S., 1943 (Univ. Sydney), "Bushlands", Penrose Road, Bundanoon.
McCaffery, Louis Henry, M.B., B.S., 1945 (Univ. Sydney), 7, Kent Street, Epping.
McNamee, Kevin Matthew, M.B., B.S., 1939 (Univ. Sydney), High Street, West Maitland.
Mansell, Hazel, M.B., B.S., 1945 (Univ. Sydney), "Woodrow", Herbert Street, Summer Hill.
Mooney, Austin Jeremiah, M.B., B.S., 1942 (Univ. Sydney), (Captain), Inter-Service Medical Wing, A.M.F., N.S.W. L. of C. Area.
Mortlock, Jack Mills, M.B., B.S., 1944 (Univ. Sydney), Queen Street, Barraba.
O'Neill, John Galvin, M.B., 1943 (Univ. Sydney), 5, Wallis Parade, North Bondi.
Pope, David Carington, M.B., B.S., 1942 (Univ. Sydney), 62, Roseville Avenue, Roseville.
Scanlan, Derrick, M.B., 1940 (Univ. Sydney), 16, Terrace Street, Newcastle.
Smith, Gordon Stewart, M.B., B.S., 1945 (Univ. Sydney), Marrickville District Hospital, Marrickville.
Storey, John Eric Macartney, M.B., B.S., 1942 (Univ. Sydney), Quirindi.
Walker, Reginald Lavis, M.B., B.S., 1945 (Univ. Sydney), Marrickville District Hospital, Marrickville.

THE undermentioned have been elected members of the South Australian Branch of the British Medical Association:

Dibden, Frederick Andrew, M.B., B.S., 1941 (Univ. Adelaide), 15, The Groove, Dulwich.
Robertson, Ronald Peter, M.B., B.S., 1945 (Univ. Adelaide), 43, Austral Terrace, Malvern.
Kekwick, Daintry Ned, M.B., B.S., 1942 (Univ. Adelaide), 33, Buxton Street, North Adelaide.

THE FEDERAL MEDICAL WAR RELIEF FUND.

THE following contributions to the Federal Medical War Relief Fund have been received:

Western Australia.

R. D. McKellar Hall, £25.
J. H. Young, H. H. Stewart, £21.
B. J. Hallion, £20.
J. A. McAuliffe and A. F. Walsh (joint contribution), D. B. Phelan, M. S. Williams, H. Rockett, N. M. Cuthbert, £10 10s.

J. A. Musso, G. A. Thompson, H. Breidahl, M. S. Bell, J. H. Stubbe, I. O. Thorburn, S. Boyd, L. A. Hayward, R. R. Anderson, A. M. Murphy, £10.

P. J. Orton, £7 7s.

Donald Smith, A. Samuel, A. Einichovici, T. C. Anthony, D. E. Copping, K. G. Aberdeen, L. G. B. Cumpston, R. J. Gollan, F. W. Carter, H. W. Ward, £5 5s.

E. R. Dermer, R. M. Porter, V. G. Whelan, £5.

H. R. Elphick, W. H. Nelson, R. A. D. Pope, D. Browne, G. C. Moss, W. Seed, £3 3s.

F. W. Simpson, R. I. Greenham, L. D. Hodby, V. Cook, £2 2s.

E. C. L. Ryan, B. Glesinger, £2.

T. L. Anderson, G. Oxer, D. Parker, £1 1s.

Total: £348 16s., less bulk postage expenses, £7 6s. 6d., £341 9s. 6d.

Grand total: £6,499 2s. 9d.

Obituary.

GEORGE MURRAY ANDERSON.

WE regret to announce the death of Dr. George Murray Anderson, which occurred on April 16, 1946, at Hobart, Tasmania.

Medical Appointments.

Dr. A. E. Machin, Principal Medical Officer, and Dr. H. M. North, Senior Medical Officer, Medical Branch, Department of Public Instruction, New South Wales, have been appointed Director and Assistant Director respectively of School Medical Services, Department of Public Health, New South Wales.

The undermentioned medical officers, Medical Branch, Department of Public Instruction, New South Wales, have been appointed medical officers, Department of Public Health, New South Wales: Dr. W. K. W. Flook, Dr. P. J. A. L. L. Quessy, Dr. C. R. Campling, Dr. A. G. C. Budge, Dr. M. J. Frizell, Dr. H. L. Tonkin, Dr. M. E. Edelsten-Pope, Dr. E. C. M. Wallace, Dr. M. N. Gors, Dr. M. D. A. McClemens, Dr. E. Clement, Dr. B. G. Cooley and Dr. I. B. Sebire.

Dr. C. S. Swan has been appointed honorary clinical assistant to the Ophthalmological Section of the Royal Adelaide Hospital, Adelaide.

Dr. S. B. Forgan has been appointed a member of the Medical Board, Port Pirie, South Australia, under the provisions of the *Workmen's Compensation Act*, 1932-1944.

Dr. Terence Butler has been appointed a member of the Nurses' Registration Board, in accordance with Section 3 of the *Nurses' Registration Act*, 1927, of Tasmania.

Books Received.

"A Handbook for Dissectors", by J. C. Boileau Grant and H. A. Cates; Second Edition; 1945. Sydney: Angus and Robertson; Baltimore: The Williams and Wilkins Company. 7¼" × 4¾", pp. 402, with illustrations. Price: 20s.

"A Short History of Japan", by A. L. Sadler; 1946. Sydney, London: Angus and Robertson Limited. 8¼" × 5¼", pp. 400, with illustrations. Price: 21s.

"The Vitamins in Medicine", by Franklin Bicknell, D.M., M.R.C.P., and Frederick Prescott, M.Sc., Ph.D., A.R.I.C., M.R.C.S.; Second Edition, revised and enlarged; 1946. London: William Heinemann (Medical Books) Limited. 9½" × 6", pp. 928, with many illustrations. Price: 50s.

"The 1945 Year Book of General Surgery", edited by Evarts A. Graham, A.B., M.D.; 1946. Chicago: The Year Book Publishers Incorporated. Melbourne: W. Ramsay (Surgical) Proprietary Limited. 7" × 4¾", pp. 736, with illustrations. Price: 24s.

"An Introduction to Essential Hypertension", by Richard F. Herndon, M.D., F.A.C.P.; 1946. Springfield: Charles C. Thomas. 8¾" × 5¾", pp. 99, with illustrations. Price: $2.50.

"Nutrition and Chemical Growth in Childhood", by Icie G. Macy, Ph.D., ScD., with a foreword by Lawrence Reynolds, M.D., and a supplement by Julia Outhouse Holmes, Ph.D.; Volume II, original data; 1946. Springfield: Charles C. Thomas. 9" × 6", pp. 1048, with many illustrations. Price: $10.00.

"Dr. W. C. Röntgen", by Otto Glasser; 1945. Springfield: Charles C. Thomas. 8¼" × 5¼", pp. 179, with illustrations. Price: $4.50.

"Research in Medicine and Other Addresses", by Sir Thomas Lewis, C.B.E., F.R.S., F.R.S.E., M.D., D.Sc., LL.D., F.R.C.P.; Second Edition. London: H. K. Lewis and Company Limited. 8¼" × 5¼", pp. 112. Price: 5s. net.

Diary for the Month.

MAY 1.—Western Australian Branch, B.M.A.: Council Meeting.
MAY 1.—Victorian Branch, B.M.A.: Branch Meeting.
MAY 2.—South Australian Branch, B.M.A.: Council Meeting.
MAY 3.—Queensland Branch, B.M.A.: Branch Meeting.
MAY 7.—New South Wales Branch, B.M.A.: Organization and Science Committee.
MAY 10.—Queensland Branch, B.M.A.: Council Meeting.
MAY 14.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
MAY 14.—Tasmanian Branch, B.M.A.: Ordinary Meeting.
MAY 15.—Western Australian Branch, B.M.A.: General Meeting.
MAY 16.—Victorian Branch, B.M.A.: Executive Meeting.
MAY 16.—South Australian Branch, B.M.A.: Council Meeting.
MAY 21.—New South Wales Branch, B.M.A.: Medical Politics Committee.
MAY 22.—Victorian Branch, B.M.A.: Council Meeting.
MAY 23.—New South Wales Branch, B.M.A.: Clinical Meeting.
MAY 24.—Queensland Branch, B.M.A.: Council Meeting.
MAY 28.—New South Wales Branch, B.M.A.: Ethics Committee.
MAY 30.—South Australian Branch, B.M.A.: Council Meeting.
MAY 30.—New South Wales Branch, B.M.A.: Branch Meeting.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmain United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phœnix Mutual Provident Society.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2).

Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this journal. The management cannot accept any responsibility or recognize any claim arising out of non-receipt of journals unless such a notification is received within one month.

SUBSCRIPTION RATES—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rates are £2 for Australia and £2 5s. abroad *per annum* payable in advance.